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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(60) Parent Application or Grant UNITED VIDEO PROPERTIES, INC. [/]; O. ELLIS, Michael, D. [/]; O. THOMAS, William, L. [/]; O. LEMMONS, Thomas, R. [/]; O. TREYZ, G., Victor; O.		
(54) Title: CLIENT-SERVER BASED INTERACTIVE TELEVISION PROGRAM GUIDE SYSTEM WITH REMOTE SERVER RECORDING (54) Titre: SYSTEME GUIDE DE PROGRAMMES DE TELEVISION INTERACTIF SUR UNE BASE CLIENT-SERVEUR AVEC ENREGISTREMENT SUR SERVEUR A DISTANCE		
(57) Abstract <p>An interactive television program guide system is provided. An interactive television program guide provides users with an opportunity to select programs for recording on a remote media server. Programs may also be recorded on a local media server. The program guide provides users with VCR-like control over programs that are played back from the media servers and over real-time cached copies of the programs. The program guide also provides users with an opportunity to designate gift recipients for whom programs may be recorded.</p>		
(57) Abrégé <p>L'invention concerne un système guide de programmes de télévision interactif. Un guide de programmes de télévision interactif offre aux utilisateurs la possibilité de choisir des programmes pour les enregistrer sur un serveur support à distance. Les programmes peuvent également être enregistrés sur un serveur support local. Le guide de programmes permet aux utilisateurs de bénéficier d'une commande de type magnétoscope à cassettes sur des programmes lus à partir des serveurs supports et des copies cachées en temps réel des programmes. Le guide de programmes offre également aux utilisateurs la possibilité de désigner des bénéficiaires pour lesquels des programmes peuvent être enregistrés.</p>		

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<p>(21) International Application Number: PCT/US99/15939            (22) International Filing Date: 13 July 1999 (13.07.99)              (30) Priority Data:            60/092,807 14 July 1998 (14.07.98) US            09/332,244 11 June 1999 (11.06.99) US</p> <p>(71) Applicant: UNITED VIDEO PROPERTIES, INC. [US/US];            7140 South Lewis Avenue, Tulsa, OK 74136 (US).</p> <p>(72) Inventors: ELLIS, Michael, D.; 1300 Kingwood Place, Boulder, CO 80304 (US). THOMAS, William, L.; 11611 South 70th East Avenue, Bixby, OK 74008 (US). LEMMONS, Thomas, R.; Route 2, Box 1178, Sand Springs, OK 74063 (US).</p> <p>(74) Agents: TREYZ, G., Victor et al.; Fish &amp; Neave, 1251 Avenue of the Americas, New York, NY 10020 (US).</p>		<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published  <i>Without international search report and to be republished upon receipt of that report.</i></p>
<p>(54) Title: CLIENT-SERVER BASED INTERACTIVE TELEVISION PROGRAM GUIDE SYSTEM WITH REMOTE SERVER RECORDING</p> <p>(57) Abstract</p> <p>An interactive television program guide system is provided. An interactive television program guide provides users with an opportunity to select programs for recording on a remote media server. Programs may also be recorded on a local media server. The program guide provides users with VCR-like control over programs that are played back from the media servers and over real-time cached copies of the programs. The program guide also provides users with an opportunity to designate gift recipients for whom programs may be recorded.</p>		
<p style="text-align: center;">10</p> <pre> graph TD     A["MAIN FACILITY PROGRAM GUIDE DATA SOURCE 14"] -- 12 --&gt; B["INTERACTIVE PROGRAM GUIDE TELEVISION EQUIPMENT 17"]     B -- 18 --&gt; A     B -- 197 --&gt; C["BILLING SYSTEM 199"]   </pre>		

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**Description**

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CLIENT-SERVER BASED INTERACTIVE TELEVISION  
PROGRAM GUIDE SYSTEM WITH REMOTE SERVER RECORDING

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Background of the Invention

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5 This invention relates to interactive television program guide systems, and more particularly, to interactive television program guide systems that allow users to record programs and program guide data on a media server.

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10 Cable, satellite, and broadcast television systems provide viewers with a large number of television channels. Viewers have traditionally consulted printed television program schedules to determine the programs being broadcast at a particular

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15 time. More recently, interactive television program guides have been developed that allow television program information to be displayed on a user's television. Interactive television program guides allow the user to navigate through television program

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20 listings using a remote control. In a typical program guide, various groups of television program listings

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10                  are displayed in predefined or user-defined categories.  
Listings are typically displayed in a list, grid, or  
table.

15                  Program listings and other program guide data  
5                  are typically provided by a satellite uplink facility  
to a number of cable system headends. Each headend  
distributes the program guide data to a number of  
users. Interactive television program guides are  
typically implemented on the users' set-top boxes. A  
20                  10 typical set-top box is connected to a user's television  
and videocassette recorder. Program guide systems that  
allow users to record programs are described, for  
example, in Ellis et al. U.S. patent application Serial  
25                  No. 08/924,239, filed September 5, 1997, which is  
15 hereby incorporated by reference herein in its  
entirety.

30                  Such systems are deficient in a number of  
respects. The processing and storage capabilities of  
the set-top box and videocassette recorder are  
20                  generally limited. This, in turn, may limit the  
functionality of the guide. Videocassette recorders  
may add significantly to the cost of in-home television  
equipment. They are mechanical systems, prone to  
failure, and their proper operation relies in part on  
25                  20 users setting them properly (i.e., remembering to put a  
tape in). Setting up a VCR to work cooperatively with  
a program guide may be a complex process in some  
systems and may frustrate users. In addition, users  
cannot record multiple programs simultaneously without  
30                  25 having multiple VCRs, and recording one program while  
watching another typically requires additional hardware  
or an enhanced set-top box. Systems in which program

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10 guides allow users to record one program while watching another are described, for example, in Lemmons et al. U.S. patent application Serial No. 60/089,487, filed June 16, 1998 which is hereby incorporated by reference 5 herein in its entirety.

15 Systems that use hard disk technology to store programs have also been developed. Interactive television program guide systems that have digital storage devices are described, for example, in Hassell 20 et al. U.S. patent application Serial No. 09/157,256, filed September 17, 1998. Hard-disk based products have also been developed by TiVo, Inc. of Sunnyvale, California, and Replay Networks, Inc. of Mountainview, California. These systems are deficient in that they 25 require additional hardware in the user's home that may significantly increase the cost of the user's home 15 television equipment. Such systems also do not allow users to record multiple programs simultaneously without having multiple devices in the home.

30 20 Some current television platforms support a return path between the set-top boxes and the headends. Client-server based program guides have been developed 35 in which set-top boxes act as clients that communicate with servers located at headends via return paths. The 25 servers typically provide program listings information (e.g., program titles and broadcast times) to the set-top boxes in response to requests that are generated by the set-top boxes.

40 45 Video-on-demand (VOD) systems have also been 30 developed. Such systems typically record all programs that are distributed by a headend, or only a chosen subset of programs. In the former approach, vast

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10 amounts of storage is required at the server to ensure  
that all possible videos desired by users will be  
available. In the latter approach, users are limited  
to viewing only those programs that the headend  
5 operator decided to record.

15 In one cable television system known as "The  
Box," viewers can call a cable operator to request the  
airing of a particular music video from an archive of  
music videos. The requested videos are broadcast on a  
20 dedicated channel for all viewers to see. This  
approach suffers from a number of deficiencies. First,  
users do not have the convenience of ordering programs  
using their television equipment. In addition, viewers  
must wait for the airing of other viewers' selections  
25 before theirs are aired. Also, viewers are limited to  
selecting videos from only those archived. Some  
viewers may desire music videos that are not shared in  
the archive. These viewers have no way of selecting a  
30 video for archiving or viewing other videos.

20 In a cable television system known as "Your  
Choice TV," television programs that have previously  
35 aired are repeated on a dedicated set of television  
channels. Viewers may order a repeat of a program for  
a small fee. However, the repeats are aired at  
40 scheduled times, which may not be convenient for the  
viewer. Also, desired programs may not be available to  
viewers because the cable system operator decides which  
programs to record.

45 It is therefore an object of the present  
30 invention to provide a program guide system that allows  
users to direct a server to record certain programs  
that later may be played back to the user on demand.

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Summary of the Invention

This and other objects of the present invention are accomplished in accordance with the principles of the present invention by providing a program guide system that records programs at a remote media server in response to user requests. A main facility provides program guide data to a number of television distribution facilities. The television distribution facilities distribute the program guide data to a number of interactive television program guides using any suitable approach (e.g., continuously, periodically, in response to requests or commands, etc.) The interactive television program guides may be implemented wholly on the users' television equipment. Alternatively, the program guides may be implemented partially on the users' television equipment and partially implemented on a server using a suitable client-server based or distributed approach.

The remote media server may be located at a program guide distribution facility or other suitable distribution facility (e.g., a cable system headend, a broadcast distribution facility, a satellite television distribution facility, or any other suitable type of television distribution facility). The remote media server may record programs and, if desired, program guide data. The remote media server may also record data associated with programs, such as data carried in a vertical blanking interval (VBI) or in a digital data track. The programs, program associated data, program guide data or any suitable combination thereof, may be recorded in response to requests generated by the interactive television program guide. Programs

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recorded by the remote media server may be distributed to users using any suitable video-on-demand or near-video-on-demand approach. Users may also have local media servers (e.g., personal computers) in their homes 5 for recording programs and, if desired, program guide data.

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Further features of the invention, its nature and various advantages will be more apparent from the accompanying drawings and the following detailed 10 description of the preferred embodiments.

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Brief Description of the Drawings

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FIG. 1 is a schematic block diagram of an illustrative system in accordance with the present invention.

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FIGS. 2a-2e are schematic diagrams showing illustrative arrangements for the interactive program guide equipment of FIG. 1 in accordance with the present invention.

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FIG. 3 is a schematic diagram showing an illustrative arrangement for the storage of FIGS. 2a-2e in accordance with the present invention.

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FIG. 4 is a schematic diagram showing an illustrative arrangement of media directories maintained by the storage devices of FIG. 3.

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FIG. 5 is an illustrative data flow diagram showing how programs may be recorded.

FIGS. 6a and 6b are diagrams illustrating the use of user pointers to play back a single program for multiple users in accordance with the present 30 invention.

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10 FIG. 7 is a schematic block diagram of an  
illustrative arrangement for the user television  
equipment of FIGS. 2a-2e in accordance with the present  
invention.

15 5 FIG. 8 shows an illustrative arrangement for  
the remote control of FIG. 7 in accordance with the  
present invention.

20 10 FIG. 9 is a generalized schematic block  
diagram of portions of the illustrative user television  
15 equipment of FIG. 7 in accordance with the present  
invention.

25 20 FIG. 10 shows an illustrative main menu  
screen that may be displayed by the program guide to  
provide users with access to various program guide  
15 functions in accordance with the present invention.

30 25 FIG. 11a shows an illustrative program  
listings screen in which program listings are displayed  
by time in accordance with the present invention.

35 30 FIG. 11b shows an illustrative program  
listings screen in which program listings are displayed  
by channel in accordance with the present invention.

40 35 FIG. 11c shows an illustrative program  
listings screen in which program listings are displayed  
by category in accordance with the present invention.

45 40 FIGS. 12a and 12b show illustrative program  
guide display screens in which pay-per-view program  
listings are displayed in accordance with the present  
invention.

50 45 FIG. 13a shows an illustrative FLIP display  
30 that may be displayed by the program guide when a user  
changes channels in accordance with the present  
invention.

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FIG. 13b shows an illustrative BROWSE display that the program guide may display when a user indicates a desire to browse through program listings for channels other than the one that a user is watching 5 in accordance with the present invention.

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FIG. 14a shows an illustrative record overlay that may be displayed by the program guide when a user indicates a desire to record the program in accordance with the present invention.

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FIG. 14b shows an illustrative record overlay that may be displayed by the program guide while a user is in a program guide display screen. The overlay may be displayed when a user indicates a desire to record a program.

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FIG. 14c and 14d show illustrative record overlays that indicate a charge for recording a program and that provide a user with an opportunity to confirm the record.

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FIG. 14e shows an illustrative overlay that the program guide may display when a user indicates a desire to record a program that is part of a program grouping.

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FIG. 15a shows an illustrative pay-per-view ordering overlay.

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FIG. 15b shows an illustrative pay-per-view order confirmation overlay.

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FIG. 16 shows an illustrative record overlay that the program guide may display when a user selects a program for recording that is copy protected.

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FIG. 17 shows an illustrative program guide display screen for providing a user with an opportunity to order a pay-per-view program package.

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10 FIG. 18a shows an illustrative directory  
overlay that may be displayed by the program guide  
while a user is watching television. The overlay may  
be displayed when a user indicates a desire to view a  
5 directory of programs that have been recorded for a  
user on the remote media server of FIGS. 2a-2e or the  
15 local media server of FIG. 7.

20 FIG. 18b shows an illustrative directory  
overlay that may be displayed by the program guide  
10 while a user is in a program guide display screen. The  
overlay may be displayed when a user indicates a desire  
to see a directory of programs that have been recorded  
for a user on the remote media server of FIGS. 2a-2e or  
25 the local media server of FIG. 7.

30 FIG. 18c shows an illustrative directory  
overlay that may be displayed by the program guide  
15 while a user is in a display screen in which listings  
are displayed by category in accordance with the  
present invention.

35 FIG. 18d shows an illustrative directory  
screen that may be displayed by the program guide when  
20 a user indicates a desire to access a directory of  
programs recorded for a user on the remote media server  
of FIGS. 2a-2e or the local media server of FIG. 7.

40 FIG. 18e shows an illustrative directory menu  
screen that the program guide may display when a user  
25 indicates a desire to access various directory screens,  
such as that shown in FIG. 14d, but in which recorded  
program listings are sorted in various ways.

45 FIG. 18f shows an illustrative directory  
30 screen of programs that a user has selected for

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recording by a media server but that have not yet been  
10 recorded.

FIG. 19 shows an illustrative overlay that  
the program guide may display when a user indicates a  
15 desire to play back a program. The overlay indicates a  
charge for the playback.

FIG. 20 is an illustrative full information  
screen that may be displayed by the program guide when  
a user indicates a desire to see information on a  
20 program that has been recorded for a user on the remote  
media server of FIGS. 2a-2e.

FIG. 21 shows an illustrative overlay that  
the program guide may display when a user indicates a  
25 desire to record or play back a program that is  
15 parentally locked.

FIG. 22 shows an illustrative overlay for  
providing users with control of a program recorded on  
the remote media server of FIGS. 2a-2e or the local  
30 media server of FIG. 7.

FIG. 23 shows an illustrative overlay that  
the program guide may display when a user indicates a  
35 desire to real-time cache a program on the remote media  
server of FIGS. 2a-2e or the local media server of  
FIG. 7.

FIG. 24 shows an illustrative setup screen in  
which a user may set various settings for recording  
programs on or playing programs back programs from the  
remote media server of FIGS. 2a-2e or the local media  
40 server of FIG. 7.

FIGS. 25a and 25b are illustrative super-  
45 program screens for providing users with an opportunity

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to define super-programs in accordance with the present invention.

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FIG. 26 is a flowchart of an illustrative overview of steps involved in recording programs and associated program guide data on the remote media server of FIGS. 2a-2e or the local media server of FIG. 7 in accordance with the present invention.

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FIG. 27 is a somewhat more detailed flowchart of illustrative steps involved in recording programs and associated program guide data on the remote media server of FIGS. 2a-2e or the local media server of FIG. 7 in accordance with the present invention.

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FIG. 28 is a flowchart of an illustrative overview of steps involved in playing back programs and associated program guide data from the remote media server of FIGS. 2a-2e or the local media server of FIG. 7 in accordance with the present invention.

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FIG. 29 is a somewhat more detailed flowchart of illustrative steps involved in playing back programs and associated program guide data from the remote media server of FIGS. 2a-2e or the local media server of FIG. 7 in accordance with the present invention.

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FIG. 30 is a flowchart of illustrative steps involved in providing a user with access to real-time cached copies of programs in accordance with the present invention.

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FIG. 31 is a flowchart of illustrative steps involved in providing a user with the opportunity to define and play back super-programs in accordance with the present invention.

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Detailed Description of the Preferred Embodiments

An illustrative system 10 in accordance with the principles of the present invention is shown in FIG. 1. Main facility 12 provides program guide data from program guide data source 14 to interactive program guide television equipment 17 via communications link 18. There are preferably numerous pieces or installations of interactive program guide television equipment 17, each linked to main facility 12 by a respective communications link 18 although only one such piece or installation of interactive program guide television equipment 17 is shown in FIG. 1 to avoid overcomplicating the drawing.

Link 18 may be a satellite link, a telephone network link, a cable or fiber optic link, a microwave link, an Internet link, a combination of such links, or any other suitable communications link. If it is desired to transmit video signals over link 18 in addition to data signals, a relatively high bandwidth link such as a satellite link may generally be preferred to a relatively low bandwidth link such as a telephone line.

The program guide data transmitted by main facility 12 to interactive program guide television equipment 17 may include television programming data (e.g., program identifiers, times, channels, titles, and descriptions) and other data for services other than television program listings (e.g., help text, pay-per-view information, weather information, sports information, music channel information, associated Internet web links, associated software, etc.). The program guide data may also include unique identifiers

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for each showing of each program, identifiers for  
10 program groupings (e.g., series, mini-series, orderable  
packages of programs, etc.), or any other suitable  
identifier. As used herein television "program" and  
5 "programming" are intended to mean any type of show or  
advertisement carried on a regular, premium, pay-per-  
view, music, or other type of television channel, and  
15 may include movies, pay-per-view programs, sporting  
events, music programs, commercials and any other  
20 suitable type of television program.

Interactive program guide television  
25 equipment 17 may be connected to billing system 199 via  
communications link 197. Communications link 197 may  
be any suitable communications link, such as a serial  
15 connection, parallel connection, universal serial bus  
(USB) connection, a telephone link, computer network  
link, Internet link, or any other suitable  
link, Internet link, or any other suitable  
30 communications link. Billing system 199 receives  
information from interactive program guide television  
20 equipment 17 regarding programs that are ordered,  
recorded, or played back on interactive program guide  
television equipment 17. Billing system 199 may be any  
35 computer based system suitable for generating bills for  
users or crediting and debiting accounts of users based  
25 on the information received from interactive program  
guide television equipment 17.

An interactive television program guide is  
40 implemented on interactive program guide television  
equipment 17. Five illustrative arrangements for  
45 30 interactive program guide television equipment 17 are  
shown in FIGS. 2a-2e. As shown, interactive program  
guide television equipment 17 may include program guide

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distribution equipment 21 located at program guide distribution facility 16, and user television equipment 22.

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The interactive television program guide may 5 run totally on user television equipment 22 using the arrangements of FIGS. 2a and 2c, or may run partially on user television equipment 22 and partially on interactive program guide television equipment 17 using a suitable client-server or distributed processing 10 arrangement such as those shown in FIGS. 2b and 2d. Program guide distribution facility 16 may be any suitable distribution facility, and may have 20 distribution equipment 21.

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Distribution equipment 21 of FIGS. 2a, 2b, 15 2c, and 2d is equipment suitable for providing program guide data to user television equipment 22 over communications path 20. Distribution equipment 21 may include, for example, suitable transmission hardware 30 for distributing program guide data on a television 20 channel sideband, in the vertical blanking interval of a television channel, using an in-band digital signal, using an out-of-band digital signal, or by any other suitable data transmission technique. Analog or 35 digital video signals (e.g., television programs) may 25 also be distributed by distribution equipment 21 to user television equipment 22 over communications paths 20 on multiple television channels.

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Alternatively, videos may be distributed to user 45 30 television equipment 22 from some other suitable distribution facility, such as a cable system headend, a broadcast distribution facility, a satellite

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television distribution facility, or any other suitable type of television distribution facility.

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Communications paths 20 may be any communications paths suitable for distributing program guide data. Communications paths 20 may include, for example, a satellite link, a telephone network link, a cable or fiber optic link, a microwave link, an Internet link, a data-over-cable service interface specification (DOCSIS) link, a combination of such

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links, or any other suitable communications link. Communications paths 20 preferably have sufficient bandwidth to allow program guide distribution facility

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16 or another distribution facility to distribute

television programming to user television equipment 22.

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15 There are typically multiple pieces of user television equipment 22 and multiple associated communications paths 20, although only one piece of user television equipment 22 and communications path 20 are shown in FIGS. 2a-2d to avoid overcomplicating the drawings. If 20 desired, television programming and program guide data may be provided over separate communications paths.

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FIG. 2b shows an illustrative arrangement for interactive program guide television equipment 17 in a client-server based or distributed interactive program 25 guide system. As shown in FIG. 2b, distribution equipment 21 may include program guide server 25. Program guide server 25 may use any suitable combination of hardware and software to provide a client-server based program guide. Program guide 30 server 25 may, for example, run a suitable database engine (e.g., SQL Server by Microsoft) and provide program guide data in response to queries generated by

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10 a program guide client implemented on user television equipment 22. If desired, program guide server 25 may be located at main facility 12, or other location, such as a cable system headend, a broadcast distribution  
5 facility, a satellite television distribution facility, or any other suitable type of television distribution facility.

15 The program guide may retrieve program guide data from program guide server 25 using any suitable 20 client-server based approach. The program guide may, for example, pass SQL requests as messages to program 25 guide server 25. In another suitable approach, the program guide may invoke remote procedures that reside 15 on program guide server 25 using one or more remote procedure calls. Program guide server 25 may execute SQL statements for such invoked remote procedures. In still another suitable approach, client objects 30 executed by the program guide may communicate with server objects executed by program guide server 25 20 using, for example, an object request broker (ORB). This may involve using, for example, Microsoft's 35 Distributed Component Object Model (DCOM) approach.

40 The program guide implemented on interactive program guide television equipment 17 may communicate 25 with program guide server 25 over communications path 20 using any suitable network and transport layer protocols, if desired. They may communicate, for example, using a protocol stack which includes 45 Sequenced Packet Exchange/Internetwork Packet Exchange 30 (SPX/IPX) layers, Transmission Control Protocol/Internet Protocol (TCP/IP) layers, Appletalk Transaction Protocol/Datagram Delivery Protocol

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(ATP/DDP) layers, DOCSIS or any other suitable network and transport layer protocols.

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FIGS. 2c and 2d show illustrative Internet based interactive television program guide systems.

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5 Television distribution facility 16 may, for example, include Internet service system 61. Internet service system 61 may use any suitable combination of hardware and software capable of providing program guide data to the guide using an Internet based approach (e.g., the

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10 HyperText Transfer Protocol (HTTP)). If desired, Internet service system 61 may be located at a facility that is separate from program guide distribution facility 16.

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If the program guide is implemented on user 15 television equipment 22 of interactive program guide television equipment 17 as shown in FIG. 2c, Internet service system 61 (or other suitable equipment at program guide distribution facility 16 that is connected to Internet service system 61) may provide 20 program guide data to user television equipment 22 via the internet, or via program guide distribution equipment 21 using any suitable Internet-based approach (e.g., using the HyperText Transfer Protocol (HTTP) over a Transmission Control Protocol/Internet Protocol 25 (TCP/IP) type link). If the program guide implemented on interactive program guide television equipment 17 is a client-server guide as shown in FIG. 2d, program guide server 25 may obtain program guide data from Internet service system 61. The program guide may 30 also, however, obtain program guide data from Internet service system 61 via an Internet connection.

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In another suitable arrangement, distribution equipment 21 may include computer equipment or other suitable hardware on which a first portion or version of the interactive television program guide is implemented. A second portion or version of the program guide may be implemented on user television equipment 22. The two versions or portions of the interactive program guide may communicate using any suitable peer-to-peer communications scheme (e.g., messaging, remote procedure calls, etc.) and perform interactive program guide functions distributively between television distribution facility 16 and user television equipment 22.

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Another suitable arrangement in which an on-line program guide is implemented on interactive program guide television equipment 17 is shown in FIG. 2e. On-line program guide systems are described, for example, in Boyer et al. U.S. patent application Serial No. 08/938,028, filed September 18, 1997, which is hereby incorporated by reference herein in its entirety. The user may have personal computer (PC) 231 on which a program guide client or web browser is implemented. Personal computer 231 may be connected to Internet service system 235 via Internet link 233. Internet service system 233 may use any suitable combination of computer hardware and software capable of providing an on-line program guide server application or web site.

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Internet service system 235 may be connected to remote media server 24 of program guide distribution facility 16. In other suitable arrangements, the recording and playback functionality of remote media

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10 server 24 may be incorporated into Internet service system 235 if Internet service system 235 has suitable processing circuitry, memory, and storage.

15 Programs and program guide data may be recorded and played back on-demand by remote media server 24 in response to record and playback requests. Record and playback requests may be generated by a program guide server application or web application implemented on Internet service system 235. Record and 20 playback requests may also be generated by an interactive program guide client implemented on personal computer 231 and may be provided to remote media server 24 by Internet service system 235.

25 Programs and program guide data maybe provided by 15 Internet service system 235 to personal computer 231 using a suitable real-time Internet video approach (e.g., using the M-Bone), or may be downloaded and 30 stored by personal computer 231 for playback.

35 Remote media server 24 of FIGS. 2a, 2b, 2c, 2d, and 2e records programs, program guide data, or any suitable combination thereof and supplies either or both to user television equipment 22 in response to requests generated by the program guide. Remote media server 24 may also record program associated data, such 40 as data carried in the vertical blanking interval (VBI) of an analog television channel or in a digital data track on a digital television channel. Examples of program associated data are subtitles, text tracks, music information tracks, additional video formats, 45 additional languages, or other additional data. As used herein, recording and playing back "programming" or "programs" may include, but does not require,

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10 recording and playing back program associated data.  
Remote media server 24 is shown as being located at  
program guide distribution facility 16, but may be  
located at a separate distribution facility (e.g., a  
5 cable system headend, a broadcast distribution  
facility, a satellite television distribution facility,  
or any other suitable type of television distribution  
facility).

15 Remote media server 24 may be based on any  
20 suitable combination of hardware and software suitable  
for recording and playing back programs or program  
guide data on demand. As defined herein, the phrase  
"recording on-demand" refers to recording a program or  
program guide data in response to a user's selection of  
25 a program for recording. The actual recording of a  
program need not take place at the same time that such  
a selection is made. For example, a program may be  
selected for recording before its scheduled broadcast  
30 time and may be recorded when the selected program is  
20 aired.

35 Remote media server 24 may include processing  
circuitry 11, memory 13, and storage 15. Processing  
circuitry 11 may include any suitable processor, such  
as a microprocessor or group of microprocessors, and  
40 other processing circuitry such as caching circuitry,  
direct memory access (DMA) circuitry, digitizing  
circuitry, and input/output (I/O) circuitry.  
Processing circuitry 11 may also include circuitry  
45 suitable for decoding program and data files stored on  
30 storage 15 and converting them to suitable video  
signals for distribution by distribution equipment 21.  
If programming is stored as Moving Pictures Experts

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10 Group (MPEG) MPEG-2 files, processing circuitry 11 may include, for example, an MPEG-2 decoder for decoding the files and converting them to National Television Standards Committee (NTSC) video. In another suitable  
15 5 approach, processing circuitry passes the MPEG-2 files to distribution equipment 21 for distribution to users as an MPEG-2 data stream. The MPEG-2 data stream may be decoded and displayed by user television equipment 22.

20 10 Memory 13 may be any memory suitable for caching and storing computer code for performing the functions of processing circuitry 11. Memory 13 may be used to cache video programs, portions of video programs, or program guide data for processing  
25 15 25 circuitry 11 while programs are being played back or recorded.

30 30 Storage 15 may be any storage suitable for recording programming files and associated program guide data. One suitable arrangement for storage 15 is  
20 35 20 shown in FIG. 3. The storage arrangement of FIG. 3 is only illustrative. Storage 15 may include any suitable recordable storage system and medium. Storage 15 may include, for example, tape array 51, optical storage tower 53, redundant arrays of independent disks (RAID)  
40 25 55, any other suitable mass storage system, or any suitable combination thereof. Tape array 51 may include any suitable high-speed mass storage tape array, such as an 8mm tape array. Tape array 51 may back-up or archive programs stored on optical storage  
45 30 45 tower 53 or RAID 55.

50 50 Optical storage tower 53 may be any suitable recordable optical storage system. Optical storage

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10 tower 53 may, for example, record programs on recordable compact disks (CDs) or digital versatile disks (DVDs). During playback, programs and data stored on optical storage tower 53 may be temporarily stored in virtual memory (e.g., swap files) on RAID 55 for use by memory 13, or may be provided directly to memory 13 (e.g., by suitable DMA circuitry in processing circuitry 11) for decoding.

15 Storage 15 may be measured on the order of hundreds of gigabytes, terabytes, or more. While this may involve a considerable amount of resources, storage 15 may still require less storage than a system that recorded every program (or a large subset of them) distributed by headends for every programming time slot. Because the present system typically needs to record only those programs that are selected by users, less popular programs need not be routinely recorded, which reduces the overall storage requirements of the system. Storage 15 may also be less than the total storage that would be maintained by all users at their homes if each user recorded his or her own copies of programs individually. Remote media server 24 may allocate a specific amount of storage for each user if desired. This amount may be fixed or may be 25 configurable.

20 Recorded programs may be referenced by pointers that are maintained in one or more directories. A directory of pointers for each user, for example, may be stored in memory 13 or RAID 55. 25 User directories may also be maintained locally by the program guides. An illustrative arrangement for user directories and other directories is shown in FIG. 4.

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10           Each user directory 59 may include an identifier for  
          each program that has been recorded for the user and a  
          pointer to the storage device on which the program was  
          originally recorded. In this example, programs 1 and 3  
5            were originally recorded on optical storage tower 53.  
15           Programs 4 and 2 were originally recorded on RAID 55.  
          Programs may also be recorded on tape array 51 and  
          different parts of a single program may be recorded on  
          different storage devices if desired but these aspects  
20           of the invention are not shown in FIG. 4 to avoid  
          overcomplicating the drawing.

25           Each storage device may maintain a media  
          directory 61 and a media store 63. As used herein, a  
          media store is any physical or virtual partition of a  
15           storage device or storage medium that is used to store  
          programs, program guide data, or any suitable  
          combination thereof, and may also include an entire  
          storage device or storage medium having one or no  
          partitions. Each media directory 61 may include a list  
20           of programs recorded by the storage device. Each media  
          directory 61 may also include pointers to where the  
          programs are stored in media store 63. If desired,  
          tape array 51 may be used to archive programs that are  
          stored on optional storage tower 53 or RAID 55 for a  
25           predefined period of time (e.g., one month). In  
          addition, programs may be archived by optical storage  
          tower 53 for RAID 55 (not shown). PROGRAM 3 is an  
          example of a program that has been archived by tape  
          array 51. A media directory 61 entry may reflect the  
45           30           archiving by pointing to a media directory 61 entry on  
          tape array 51, if desired.

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10                    Remote media server 24 records programs and  
associated program guide data on storage 15 in response  
to record requests generated by the program guide  
implemented on interactive program guide television  
15                    equipment 17. As defined herein, a "record request" is  
any command, request, message, remote procedure call,  
object based communication, or any other type of  
interprocess or inter-object based communication that  
allows the program guide to communicate information on  
20                    the program that the user wishes to record to the media  
server.

25                    An illustrative data flow diagram showing how  
programs may be recorded by remote media server 24 is  
shown in FIG. 5. Record requests generated by program  
15                    guides implemented on interactive program guide  
television equipment 17 may be queued in request queue  
110 for consolidation. Consolidator 115 may be a  
30                    process running on remote media server 24.  
Consolidator 115 consolidates multiple record requests  
20                    for the same programs and places individual and group  
record jobs on job queue 120.

35                    In practice, it may not be desirable to  
record a program unless a certain number of users have  
requested it. At a predefined period of time before  
25                    the requested program airs, consolidator 115 may check  
job queue 120 to see if enough users have requested the  
program. If there are not enough users, consolidator  
115 may generate a message that is distributed back to  
the requesting user or users by distribution equipment  
40                    21. When the program guide receives such a message,  
the program guide may notify the user that the program  
is not being recorded. Alternatively, the program

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guide may request that the program be recorded by a local media server, such as local media server 29 of FIG. 6, or may record the program itself on a storage device.

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5 Illustrative entries 121 in job queue 120 are also shown in FIG. 5. The entries 121 may include, for example, the dates, start times, end times (or durations), channels, and program identifiers for the programs that have been selected for recording on 10 remote media server 24. The entries may also include lists of the users who have selected each program for recording. FIG. 5 shows, for example, that PROGRAM 2 has been selected for recording by user 1 and user 2. If a program is popular, numerous users may request 15 that it be recorded.

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Recorder 125 may be a process running on processing circuitry 11 of remote media server 24 that is suitable for monitoring job queue 120 and recording programs on storage 15. Processing circuitry 11 of 20 remote media server 24 may include, for example, one or more tuners, digital encoders, or digital decoders for tuning to or otherwise selecting programming provided by distribution equipment 21 and formatting the programs for recording by remote media server 24. Any 25 suitable combination of analog and digital tuners and decoders are hereinafter referred to as tuners to simplify the discussion. Recorder 125 may direct the one or more tuners to particular channels (analog or digital) at particular times based on entries in job 30 queue 120. In this example, recorder 125 may direct a first tuner to tune to channel 4 on December 21, 1999 to record PROGRAM 1 for user 1. Recorder 125 may also

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10 direct a second tuner to tune to channel 5 at the same time to record PROGRAM 2 for user 1 and user 2. The upper limit on the number of tuners needed for remote media server 24 may be the number of channels

15 5 distributed by distribution equipment 21. Such tuners may be based on tuning and decoding circuitry implemented using one or more integrated circuits.

If desired, recorder 125 may direct processing circuitry 11 to encode programming and 20 program guide data as digital files (e.g., MPEG-2 files) or as a digital data stream (e.g., an MPEG-2 data stream). Storage 15 may record the files or data stream using, for example, suitable DMA techniques.

25 Processing circuitry 11 may compress the digital files 15 or data stream using any suitable digital compression algorithm, if desired.

The storage device on which a program has 30 been recorded may supply recorder 125 with a pointer to the entry in the media directory 61 for the recorded

35 20 program. This may be done automatically or in response to a query generated by recorder 125. If user directories 59 (FIG. 4) are maintained by remote media server 24, recorder 125 may place entries in the user directories 59 of the users who selected the program

40 25 for recording. If copies of user directories 59 are maintained locally by the program guides, the program guides may, for example, download the user directories via program guide server 25 or using any other suitable approach. Alternatively, the program guide may just

45 30 download pointers to the media directory entries. If user directories 59 are maintained exclusively by the program guides, the program guides may receive the

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10 pointer to the media directory 61 in which the program is listed automatically in response to the record request, after issuing a suitable request for the pointer, or using any other suitable approach.

15 5 Remote media server 24 retrieves programs from storage 15 in response to retrieval requests generated by the program guides implemented on interactive program guide television equipment 17. Processing circuitry 11 may process the requests by  
20 10 searching a user's user directory 59 for the requested programs and then issuing a suitable retrieval command (or request) to storage 15 based on the pointer in the directory. For example, when user 1 requests the playing of PROGRAM 1, processing circuitry 11 issues an  
25 15 appropriate retrieval command to optical storage tower 53. The program is retrieved from media store 63 and may be passed to memory 13 (e.g., via DMA circuitry in processing circuitry 11) for decoding by processing circuitry 11 and distribution to user television  
30 20 equipment 22. If desired, processing circuitry may pass a requested program in its digital form to distribution equipment 21 for distribution to user television equipment 22.

35 35 If a requested program has been archived  
40 40 (e.g., stored on a storage device other than the one on which the program was originally stored), the original storage device may issue a suitable retrieval command to the archiving storage device in response to commands (or requests) generated by processing circuitry 11.  
45 30 For example, when user 1 requests the retrieval of PROGRAM 3 for playback, processing circuitry 11 may issue a retrieval command to optical storage tower 53.

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10                         Optical storage tower 53 in turn examines its media  
10 directory 61, determines that PROGRAM 3 has been  
archived, and issues a retrieval request to tape array  
51. Tape array 51 retrieves the program from its media  
5 store 63, and transmits it to optical storage tower 53  
15 using any suitable interconnection (e.g., a parallel  
connection, a small computer systems interface (SCSI)  
connection (e.g., wide SCSI-2, fast wide SCSI-2, ultra  
SCSI-3, etc.), a universal serial bus (USB) connection,  
20 or any other suitable connection). Alternatively, the  
archiving device, in this example tape array 51, may  
transfer the program directly to memory 13 (e.g., via  
DMA circuitry in processing circuitry 11). If desired,  
25 processing circuitry 11 may determine whether a program  
15 has been archived, and may issue a retrieval request to  
tape array 51.

30                         During system operation, multiple users may  
request the playback of a single program such that the  
playback of the program for one user overlaps the  
20 playback of the program for another user. Remote media  
server 24 may simultaneously play back the same program  
35 for a number of users by, for example, assigning a  
pointer to each user that points to the user's current  
viewing position within the program. One suitable  
25 approach may involve caching the entire program or  
40 portions of it in digital form in memory 13.

45                         FIGS. 6a and 6b illustrate how pointers may  
be used to simultaneously play the same program for  
multiple users. After remote media server 24 receives  
30 a request for a program, remote media server 24 assigns  
a pointer to the requesting user and retrieves all or a  
portion of the requested program. FIG. 6a illustrates

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remote media server 24 caching an entire two-hour movie  
that is being simultaneously played for three users.  
FIG. 5b illustrates remote media server 24 caching a  
predetermined amount (e.g., 15 minutes) of a requested  
5 movie for each of three users.

As a movie progresses, remote media server 24  
may increment each user's pointer. Remote media server  
24 may also pre-decode a predetermined amount of time  
(e.g., the next 5 minutes) of the program so that as a  
10 user's pointer advances, the video is ready for  
distribution by distribution equipment 21. If a user  
rewinds a movie, remote media server 24 may regress the  
user's pointer (i.e., move it to the left) and pre-  
decode a previous portion of the movie.

If remote media server 24 caches only  
portions of a program as shown in FIG. 6b, it may only  
cache a single copy of each portion in memory 13. As  
user 1 advances the movie toward minute 15, for  
example, remote media server 24 may check to see if  
20 minutes 15 to 30 are already cached. In this example  
they are, and the copy (to which user 2 points) may be  
used for user one. If minutes 15 to 30 were not  
already cached, media server 25 may prefetch them and  
pre-decode a suitable amount (e.g., 5 minutes) so that  
25 the video stream for user 1 is not interrupted. If  
desired, media server 25 may continually prefetch the  
next 15 minutes (or less) of data.

Program guide data and recorded videos may be  
distributed by distribution equipment 21 to user  
45 30 television equipment 22 as a suitable analog video  
signal (e.g., NTSC video), or in a suitable digital  
format (e.g., as MPEG-2 files or as an MPEG-2 data

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stream) using any suitable approach. For example, programs and program guide data may be played back by media server 24 and distributed to user television equipment 22 for viewing in real-time. If programs and program guide data are distributed as digital data stream, user television equipment 22 may decode the data stream in real time. Such on-demand programs and program guide data may be played back according to preferences that were set up by the user. In a second suitable approach, programs and program guide data are distributed as one or more digital files or as a digital data stream, and are stored by user television equipment 22 for playback. In a third suitable approach, programs and program guide data are played back by remote media server 24 and distributed according to a schedule over an analog or digital channel using a suitable near-video-on-demand (NVOD) approach. In still another suitable approach, remote media server 24 may record programs and program guide data on physical media, such as a DVD or videocassette, that are sent to the user. Any combination of these approaches, or any other suitable approach, may also be used.

An illustrative arrangement for user television equipment 22 is shown in FIG. 7. User television equipment 22 of FIG. 7 receives analog video or a digital video stream from a distribution facility at input 26. Data from program guide distribution facility 16 is also received at input 26. During normal television viewing, the user tunes set-top box 28 to a desired television channel (analog or digital). The signal for that television channel is then provided

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10 at video output 30. The signal supplied at output 30 is typically either a radio-frequency (RF) signal on a predefined channel (e.g., channel 3 or 4), or a analog demodulated video signal, but may also be a digital

15 5 signal provided to television 36 on an appropriate digital bus (e.g., a bus using the Institute of Electrical and Electronics Engineers (IEEE) 1394 standard, (not shown)). The video signal at output 30 is received by optional secondary storage device 32.

20 10 The interactive television program guide or program guide client may run on set-top box 28, on television 36, on optional digital storage device 31 (if television 36 or optional digital storage device 31 has suitable processing circuitry and memory), or on a

25 15 suitable analog or digital receiver connected to television 36. The interactive television program guide may also run cooperatively on both television 36 and set-top box 28. Interactive television application systems in which a cooperative interactive television 20 program guide application runs on multiple devices are described, for example, in Ellis U.S. patent application Serial No. 09/186,598, filed November 5, 35 1998, which is hereby incorporated by reference herein in its entirety.

40 25 Secondary storage device 32 can be any 45 suitable type of analog or digital program storage device or player (e.g., a videocassette recorder, a digital video disc (DVD) player, etc.). Program recording and other features may be controlled by

45 30 set-top box 28 using control path 34. If secondary storage device 32 is a videocassette recorder, for example, a typical control path 34 involves the use of

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10 an infrared transmitter coupled to the infrared receiver in the videocassette recorder that normally accepts commands from a remote control such as remote control 40. Remote control 40 may be used to control  
5 set-top box 28, secondary storage device 32, and television 36.

15 If desired, the user may record programs, program guide data, or a combination thereof in digital form on optional digital storage device 31. Digital  
20 storage device 31 may be a writable optical storage device (such as a DVD player capable of handling recordable DVD discs), a magnetic storage device (such as a disk drive or digital tape), or any other digital storage device. Interactive television program guide  
25 systems that have digital storage devices are described, for example, in Hassell et al. U.S. patent application Serial No. 09/157,256, filed September 17,  
30 1998, which is hereby incorporated by reference herein in its entirety.

35 20 Digital storage device 31 can be contained in set-top box 28 or it can be an external device connected to set-top box 28 via an output port and appropriate interface. Digital storage device 31 may, for example, be contained in local media server 29. If  
40 25 necessary, processing circuitry in set-top box 28 formats the received video, audio and data signals into a digital file format. Preferably, the file format is an open file format such as the Moving Pictures Expert Group (MPEG) MPEG-2 standard or the Moving Joint  
45 30 Photographic Experts Group (MJPEG) standard. The resulting data is streamed to digital storage device 31 via an appropriate bus (e.g., a bus using the Institute

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10 received directly by television 36. During normal television viewing, the video signals provided to television 36 correspond to the desired channel to which the user has tuned with set-top box 28. Video  
15 5 signals may also be provided to television 36 by set-top box 28 when set-top box 28 is used to play back information stored on digital storage device 31, or when set-top box 28 is used to decode a digital video stream, or digital files transmitted from television  
20 10 distribution facility 16.

Set-top box 28 may have communications device 37 for communicating directly with program guide server 25, remote media server 24, or Internet service system 61 over communications path 20. Communications  
25 15 device 37 may also support communications between user television equipment 22 and local media server 29 via communications path 167 if desired. Communications path 167 may be any suitable link, such as a serial or parallel link, network link, an Internet link, DOCSIS  
30 20 link, radio link, infrared link or any other suitable wired or wireless digital or analog link.

Communications device 37 may be a modem (e.g., any suitable analog or digital standard, cellular, or cable modem), network interface card  
35 25 (e.g., an Ethernet card, token ring card, etc.), or other suitable communications device. Communications device 37 may also be a personal computer with an Internet connection such as with the arrangements shown in FIGS. 2c and 2d. Television 36 may also have such a  
40 45 30 suitable communications device if desired. In an alternative approach, user television equipment 22 may communicate with remote media server 24 or Internet

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10 service system 61 via distribution equipment 21 using a suitable return path or communications path 20.

10 The program guide may communicate with program guide server 25, remote media server 24, or 5 Internet service system 61 over communications path 20 using any suitable network and transport layer 15 protocols, if desired. A protocol stack may be used which includes, for example, Sequenced Packet Exchange/Internetwork Packet Exchange (SPX/IPX) layers, 20 Transmission Control Protocol/Internet Protocol (TCP/IP) layers, Appletalk Transaction Protocol/Datagram Delivery Protocol (ATP/DDP) layers, or any other suitable network and transport layer 25 protocols. If desired DOCSIS may also be used. These 15 protocols may also be used for communicating with local media server 29, but in practice other suitable 30 protocols may be used to communicate with server 29, such as the Jini networking protocol by Sun Microsystems.

20 Local media server 29 may be a device in the 35 home of the user that is suitable for storing and playing back programs on demand. Local media server 29 may be, for example, a personal computer connected to 40 set-top box 28 via an Ethernet connection, standard 25 serial or parallel port, universal serial bus, an IEEE 1394 bus, etc.

45 Local media server 29 may have processing circuitry 33, memory 35, and storage 37. Processing circuitry 33 may include any suitable processor, such 30 as a microprocessor or group of microprocessors, and other processing circuitry such as caching circuitry, direct memory access (DMA) circuitry, and input/output

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10 (I/O) circuitry. Processing circuitry 33 may also include circuitry suitable for recording programs on demand. Processing circuitry 33 may also include circuitry suitable for decoding program and data files  
15 stored on storage 37 and converting them to suitable video signals for playback by user television equipment 22. If programming is stored as MPEG-2 files, processing circuitry 33 may include, for example, an MPEG-2 decoder for decoding the files and converting  
20 them to National Television Standards Committee (NTSC) Video.

25 Memory 35 may be any memory suitable for caching and storing computer code for performing the functions of processing circuitry 33. Memory 35 may 15 also be used to cache video programs or portions of video programs for processing circuitry 33 while the programs are being played for users. Storage 37 may be 30 any storage suitable for recording programming files and associated program guide data. Storage 37 may, for 20 example, be a suitable hard disk having a capacity measured in gigabytes or more. User directories, such as user directory 59 of FIG. 4, may be maintained by processing circuitry 33 and stored in memory 35, storage 37, or both.

35 25 An illustrative arrangement for remote control 40 is shown in FIG. 8. Remote control 40 may 40 have any suitable buttons or keys for providing a user with an opportunity to change channels, navigate within the program guide, access program guide functions, 45 30 control a storage device or media server, or any other suitable keys. More specifically, the user may depress number keys 801 to enter channel numbers, parental

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- control codes, purchase codes, etc. The user may  
10 depress "Guide" key 805 to, for example, access the  
program guide, and depress arrow keys 803, page up key  
805, and page down key 807 to navigate within the  
15 guide. The user may depress the "PLAY" key 809, "FF"  
key 811, "REW" key 813, "REC" key 815, "STOP" key 819  
and "PAUSE" key 817 to play, fast-forward, rewind,  
record, stop and pause programs on a media server or  
stage device.
- 20 A more generalized embodiment of user  
television equipment 22 of FIG. 7 is shown in FIG. 9.  
As shown in FIG. 9, program guide data from program  
guide distribution facility 16 (FIG. 1) is received by  
25 control circuitry 42 of user television equipment 22.  
15 The functions of control circuitry 42 may be provided  
using the set-top box arrangement of FIG. 7.  
Alternatively, these functions may be integrated into  
30 an advanced television receiver (e.g., a digital  
television receiver or high definition television  
20 (HDTV) receiver), personal computer television (PC/TV),  
or any other suitable arrangement. If desired, a  
35 combination of such arrangements may be used.  
User television equipment 22 of FIG. 9 may  
have secondary storage device 47, digital storage  
40 device 49, or any suitable combination thereof for  
recording programming. Secondary storage device 47 and  
digital storage device 49 may be omitted if desired.  
Secondary storage device 47 can be any suitable type of  
45 analog or digital program storage device (e.g., a  
30 videocassette recorder, a digital versatile disc (DVD),  
etc.). Program recording and other features may be  
controlled by control circuitry 42. Digital storage

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10 device 49 may be, for example, a writable optical storage device (such as a DVD player capable of handling recordable DVD discs), a magnetic storage device (such as a disk drive or digital tape), or any 5 other digital storage device.

15 Memory 63 may be any memory or other storage device, such as a random access memory (RAM), read only memory (ROM), flash memory, a hard disk drive, a combination of such devices, etc., that is suitable for

20 storing program guide application instructions and program guide data for use by control circuitry 42.

Memory 63 may also be used for caching videos. The program guide may also store a copy of the user directory 59 maintained by remote media server 24 in

25 15 memory 63. The program guide may, for example, receive copies of user directory 59 as part of the program guide data stream. In one suitable approach, user

30 directory 59 may be automatically downloaded to the program guide whenever directory 59 is entered, such as 20 when the user records a program, deletes a program, or remote media server 24 automatically deletes a program because it has been stored for too long.

35 Alternatively, the program guide may obtain copies of user directory 59 from program guide server 25 or 25 remote media server 24. With another suitable

40 approach, the program guide may maintain user directory 59 in memory 63. The program guide may include 5 pointers to media directories 61 in retrieval requests transmitted to remote media server 24.

45 30 User television equipment 22 of FIG. 9 may have communications device 51 for supporting communications between user television equipment 22 and

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10 remote media server 24 or Internet service system 61 via communications path 20. Communications device 51 may also support communications between user television equipment 22 and local media server 29. Communications  
5 device 51 may be a modem (e.g., any suitable analog or digital standard, cellular, or cable modem), network interface card (e.g., an Ethernet card, Token ring card, etc.), or other suitable communications device.

15 The user controls the operation of user television equipment 22 with user input device 46. User input device 46 may be a pointing device, wireless remote control, keyboard, touch-pad, voice recognition system, pen-based computer device or any other suitable user input device. To watch television, the user  
20 instructs control circuitry 42 to display a desired television channel on display device 45. To access the functions of the program guide, the user instructs the program guide implemented on interactive program guide television equipment 17 to generate a main menu or  
25 other desired program guide display screen for display on display device 45.

30 When a user indicates a desire to access the interactive television program guide (e.g., by using a "MENU" key on remote control 40), the program guide  
35 generates an appropriate program guide display screen for display on display device 45. A main menu screen such as illustrative main menu screen 100 of FIG. 10 may be generated that provides the user with access to various program guide functions. Main menu screens may  
40 contain various advertisements, logos, etc.

45 Illustrative main menu screen 100 of FIG. 10 includes a menu 102 of selectable program guide  
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10 features 106. If desired, selectable features 106 may be organized according to feature type. In menu 102, for example, program guide options 106 have been organized into three columns. The column labeled "TV  
15 GUIDE" is for listings-related features, the column labeled "MSO SHOWCASE" is for multiple system operator (MSO) related features, and the column labeled "VIEWER SERVICES" is for viewer-related features. The interactive television program guide may generate a  
20 display screen for a particular program guide feature when the user selects that feature from menu 102.

25 Main menu screen 100 may include one or more selectable advertisements 108. Selectable advertisements 108 may, for example, include text and  
15 graphics advertising for pay-per-view programs. When the user selects a selectable advertisement 108, the program guide may display information (e.g., pay-per-view information) or take other actions related to the content of the advertisement. Pure text advertisements  
20 may be presented, if desired, as illustrated by selectable advertisement banner 110.

30 Main menu screen 100 may also include other screen elements. The brand of the program guide product may be indicated, for example, using a product  
25 brand logo graphic such as product brand logo graphic 112. The identity of the television service provider may be presented, for example, using a service provider logo graphic such as service provider logo graphic 114. The current time may be displayed in  
30 clock display region 116. In addition, a suitable indicator such as indicator graphic 118 may be used to indicate to the user that mail from a cable operator is

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- 10 waiting for the user if the program guide supports messaging functions.
- 15 One function of the interactive television program guide may be to provide the user with the opportunity to view television program listings. A user may indicate a desire to view program listings by, for example, positioning highlight region 120 over a desired program guide option related to program listings (e.g., the "movies" option). The program
- 20 10 guide may also present program listings when the user presses a suitable key (e.g., a "GUIDE" key) on remote control 40. When the user indicates a desire to view television program listings, the program guide may obtain program listings data from a data stream
- 25 15 provided by program guide distribution facility 16, from server 25, or from memory 63 and may generate an appropriate program listings screen for display on monitor 45. A program listings screen may contain one or more groups or lists of program listings organized
- 30 20 according to one or more organization criteria (e.g., by program category).
- 35 The program listings screen may be fully or partially overlaid over a program being viewed by the user. Listings may also be overlaid over or otherwise
- 40 25 placed on the same screen as the program in a "browse" mode. The program guide may, for example, provide the user with the opportunity to view listings by time, by channel, according to a number of categories (e.g., movies, sports, children, etc.), or may allow the user
- 45 30 to search for a listing by title. Program listings may be displayed using any suitable list, table, grid, or other suitable display arrangement. If desired,

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- 10 program listings display screens may include selectable advertisements, product brand logo graphics, service provider brand graphics, clocks, or any other suitable indicator or graphic.
- 15 5 A user may indicate a desire to view program listings by time, channel, or category by, for example, selecting a selectable feature from menu 102. In response, the program guide may display program listings in a suitable listings display screen.
- 20 10 FIGS. 11a, 11b, and 11c illustrate the display of program listings by time, by channel, and by category, respectively. The program listings display screens 130, 135, and 140 of FIGS. 11a, 11b, and 11c may include highlight region 151, which highlights the
- 25 15 current program listing 150. The user may position highlight region 151 by entering appropriate commands with user input device 46. For example, if user input device 46 has a keypad, the user can position highlight region 151 using up, down, left, and right arrow keys.
- 30 20 Remote program listings may also be panned left, right, up, and down by positioning highlight region 151 using the arrow keys on remote control 40. Alternatively, a touch sensitive screen, trackball, voice recognition device, pen-based computer device, or other suitable
- 35 25 device may be used to move highlight region 151 or to select program listings without the use of highlight region 151. In still another approach, the user may speak a television program listing into a voice request recognition system. These methods of selecting program
- 40 30 listings are merely illustrative. Any other suitable approach for selecting program listings or other items in the program guide may be used if desired.

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10                 The program guide may provide the user with  
an opportunity to view program listings for other times  
or channels. The user may indicate a desire to access  
listings for other times or channels by, for example,  
15                 5 using left and right arrow keys to change time slots  
(when program listings are presented by time as shown  
in FIG. 11a), or to change channels (when program  
listings are presented by channel as shown in  
FIG. 11b). In response to such an indication, the  
20                 10 program guide may, for example, scroll or page the  
program listings to display additional program  
listings.

25                 The program listings screens of FIGS. 11a,  
11b and 11c may also include listings for programs  
25                 15 recorded by, or selected for recording by, remote media  
server 24 or local media server 29. Recorded programs  
may be displayed, for example, at the beginning of the  
listings. Programs to be recorded may be displayed in  
30                 their normal position within a list and may, if  
desired, have an icon indicating them as to be  
recorded. FIG. 11a shows, for, example, a listing for  
35                 20 a scheduled recording of "I Love Lucy" at 10:30 PM on  
June 5, 1999. The listing has icon 299 that indicates  
the listing is for a program that is to be recorded.  
40                 25 FIG. 11b shows, for example, a comedy program listing  
for a recorded copy of the comedy "Saturday Night Live"  
that was recorded at 11:00 on June 1, 1999. FIG. 11c  
shows, for example, a movie listing for a recorded copy  
of the movie "Perfect Body," recorded at 9:00 PM on May  
45                 30 31, 1999.

50                 FIGS. 11a, 11b and 11c show listings for  
recorded programs and programs scheduled for recording

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as having a slightly different listing display format  
than the listings for regular programs. For example,  
recorded programs have their actual or anticipated  
record dates displayed. If desired, any other suitable  
approach may be used to indicate that some listings are  
for recorded programs or programs scheduled for  
recording. Such listings may have a different color, a  
different font, a shading, an icon or any other effect  
that indicates they are not regular program listings.

Alternately, such listings may be omitted from program  
listings screens.

The program guide may also provide a user  
with an opportunity to view pay-per-view program  
listings. A user may, for example, indicate a desire  
to view pay-per-view program listings by selecting the  
"PPV Time" on-screen feature of main menu 102 of FIG.  
10. In response, the program guide may display pay-  
per-view program listings by time, as is illustrated by  
pay-per-view listings by time screens 203 of FIG. 12a.  
As with other listings screens, a user may scroll up  
and down to view pay-per-view program listings for  
additional channels. A user may view program listings  
for additional time slots by arrowing right. A user  
may also, for example, select selectable advertisements  
by arrowing to the left.

The program guide may also provide a user  
with an opportunity to view pay-per-view program  
listings by title. A user may indicate a desire to  
view pay-per-view program listings by title by, for  
example, selecting a "PPV Title" selectable feature  
from main menu 102 of FIG. 10. In response, the  
program guide may display pay-per-view program listings

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10 by title as shown, for example, in pay-per-view program listings by title screen 211 of FIG. 12b. The program guide may provide a user with an opportunity to highlight a selectable advertisement by, for example, 5 arrowing left.

15 The interactive program guide may allow the user to view program listings while watching television programming by, for example, overlaying a "FLIP" or "BROWSE" display region over a television program.

20 FIG. 13a shows an illustrative FLIP display 200 that the program guide may display whenever the user changes television channels. The FLIP display may contain information associated with the current program, such as the program title 210, running time 215, the current

25 channel number 216, and the current channel's call letters 225. The FLIP display may also include a number of graphics, such as brand logo 230, a sponsorship graphic, a channel logo graphic, mail indicator, selectable advertisement or any other

30 20 suitable graphic. The program's rating may also be displayed. If desired, brand logo 230 may be replaced with or used together with a selectable information icon. The user may, for example, press an "INFO" key on remote control 40 to obtain additional program 35 25 information for the program currently displayed in FLIP display 200.

40 FLIP display 200 may also include rating indicator 227 for indicating the rating of the current program. If the program guide provides a parental 45 30 control feature, the rating of the program on each new channel the user tunes to may be examined by the program guide to determine whether the program meets

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parental control settings that were previously established by the user. If the program rating is not acceptable, the program guide may, for example, display only the FLIP banner without the program video and 5 prompt for a parental control code.

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FIG. 13b shows an illustrative "BROWSE" overlay or display that the program guide may display when the user indicates a desire to browse through program listings for a given time slot (e.g., by means 10 of a "browse" key on remote control 40). The user may browse through program listings by, for example, using remote control arrow keys. Unlike the FLIP display, the BROWSE display allows the user to continue to watch 20 a program on a particular channel (e.g., channel 178) 25 while browsing for information on programs that are playing on other channels or at other times.

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The FLIP and BROWSE overlays of FIGS. 13a and 30 have been shown as including a brand logo displayed at the left of the overlay. The logo may also, for 20 example, promote different sponsors as the user browses program listings or flips between channels. The logos 35 may change within the same overlay or banner if the user displays the overlay or banner for a predefined time. The logo may, for example, automatically rotate 25 through a list of logo advertisements, returning to the first advertisement after each advertisement in the list has been displayed. The brand logo may also be replaced by a text based advertisement.

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In addition to providing the user with the 45 opportunity to access television programming and 30 program guide data in these and other ways, the program guide may provide the user with an opportunity to

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10 record programs on demand at remote media server 24 or local media server 29, to view listings or directories of the programs that have been recorded or selected for recording, and to play videos and associated program  
15 5 guide data on demand from remote media server 24 or local media server 29. The program guide may also provide a user with an opportunity to record series of programs or other program groupings (e.g., pay-per-view packages). Program guide systems that provide users  
20 10 with an opportunity to record program series are described, for example, in concurrently filed Knudson et al. U.S. patent application Serial No. \_\_\_\_\_  
25 (Attorney Docket No. UV-56), which is hereby incorporated by reference herein in its entirety.  
30 15 Users may indicate a desire to record a program or group of programs on demand by, for example, pressing a "RECORD" key on remote control 40 while watching a program or after highlighting its listing.

FIGS. 14a and 14b show illustrative overlays  
20 20 1331 that may be displayed by the program guide when a user indicates a desire to record a program on remote media server 24 or local media server 29. Overlay 1331 may be displayed when, for example, a user indicates a desire to record the program that the user is watching,  
25 35 40 45 25 as shown in FIG. 14a. Alternatively, overlay 1331 may be overlaid on a program listings display screen when, for example, a user highlights a listing and indicates a desire to record the listed program (e.g., by pressing a "RECORD" key on remote control 40), as shown  
30 50 30 in FIG. 14b. Overlay 1331 may prompt the user to confirm the record request by, for example, selecting "Yes". These ways of providing a user with the

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10 opportunity to record a program are only illustrative  
and any other suitable approach may be used.

15 FIGS. 14c and 14d show additional  
illustrative overlays of 1339 that may, for example,  
5 replace overlays 1331 of FIGS. 14a and 14b.  
Alternatively, the program guide may display overlay  
1339 when the user selects "Yes" from within overlay  
1331 of FIGS. 13a and 13b. Overlay 1339 indicates to  
the user the charge for recording the selected program  
20 10 on remote media server 24. Overlay 1339 also provides  
the user with an opportunity to confirm or cancel the  
record.

25 The charge displayed in overlay 1339 may be  
based on any suitable user billing scheme. Users may  
15 be charged, for example, on a per-record basis, based  
on how long a program is, or may be charged a flat  
subscriber rate for unlimited recording within a period  
30 (e.g. one per month). Program guide distribution  
equipment 16 may provide the charge and other suitable  
20 program guide data (e.g., the title, airtime, etc.) to  
billing system 199. Billing system 199 may generate a  
bill that is sent to the user, or may automatically  
35 debit the user's account.

40 FIG. 14e shows an illustrative overlay 1339  
25 that the program guide may display when, for example, a  
user selects a program that is part of a program  
grouping. Overlay 1447 may indicate to the user that a  
program is part of a program grouping, in this example  
45 a series, and prompt the user to confirm whether the  
30 user wishes to record all programs in the grouping. If  
the user selects "Yes," remote media server 24 or local  
media server 29 may record all programs in the

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grouping. If the user selects "No," the program guide may display overlay 1331 of FIGS. 14a, 14b, 14c, or 14d to prompt the user to confirm recording only that showing.

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5 The program guide may provide the user with an opportunity to record pay-per-view programs and packages. An illustrative pay-per-view ordering overlay 370 is shown in FIG. 15a. The program guide may display pay-per-view ordering overlay 370 when, for example, the user highlights a pay-per-view program listing and presses an "order" or other suitable key on remote control 40. Pay-per-view ordering overlay 370 may display and ordering information 374, and may prompt the user to order the selected pay-per-view program by entering a purchase code. The user may enter a purchase code using, for example, number keys on remote control 40, or may cancel the purchase and return to the last screen by selecting "CANCEL" feature 376. The program guide may also provide the user with the opportunity to confirm the pay-per-view order using illustrative order confirmation overlay 380 of FIG. 15b. If desired, the program guide may display order confirmation overlay 380 of FIG. 15b instead of pay-per-view ordering overlay 370 to provide the user with the opportunity to order a pay-per-view program without requiring the user to enter a purchase code.

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The charge displayed in overlays 370 and 380 may be set using any suitable approach. The charge may, for example, be the same whether a user watches a pay-per-view or records it. Alternatively, the user may be charged a different fee when just recording a pay-per-view program. In another suitable approach,

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10 charges for pay-per-view programs may differ depending  
on the length of the program. In still another  
suitable approach, the user may pay a flat charge for  
recording any amount of pay-per-views within a  
15 5 predetermined period (e.g., a month). The charge may  
be provided by program guide distribution equipment 16  
to billing system 199 for billing the user or otherwise  
adjusting the user's account.

20 When a user indicates a desire to record a  
10 pay-per-view package by, for example, selecting a  
package listing from pay-per-view program listings  
screens 203 or 211 of FIGS. 12a and 12b, the program  
guide may display a package order screen, such as  
25 package order screen 811 of FIG. 17. Package order  
15 screen 811 may prompt a user for a purchase code.  
After a user enters a correct purchase code, the  
program guide orders the pay-per-view package from  
30 program guide distribution facility 16 or another  
suitable distribution facility.

20 The charge of the package as displayed in  
35 FIG. 17 may be set using any suitable approach. The  
charge may, for example, be the same whether a user  
watches each pay-per-view program in the package or  
whether the user records each program. Alternatively,  
40 25 the user may be charged a different fee when recording  
one or more pay-per-view programs in a package than  
when watching them. In another approach, charges for  
pay-per-view programs may differ depending on the  
length of each program in the package. In still  
45 30 another approach, the user may pay a flat charge for  
recording any amount of pay-per-views within a  
predetermined period (e.g., a month). The charge may

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10 be provided by program guide distribution equipment 16  
to billing system 199 for billing the user or otherwise  
adjusting the user's account.

When a user indicates a desire to record a  
5 program or program grouping on remote media server 24  
or local media server 29 (and possibly a desire to  
confirm recording of the program), the program guide  
generates a record request that is transmitted to the  
appropriate remote media server by communications  
10 device 51 (FIG. 9) via communications path 20 or 31.  
The record request may include, for example, an  
identifier for the program that the user wishes to  
record, an identifier for the user, and, if desired,  
any other information related to the program and the  
15 user. If the user indicated a desire to record a  
program grouping, the request may include a grouping  
identifier or the program identifiers of the  
constituent programs.

At the time a selected program or program in  
20 a grouping airs (which may be the time at which the  
program is selected for recording), remote media server  
24 or local media server 29 may record the program and  
any associated program guide data. Program guide data  
may be stored as files associated with the program  
25 using pointers. Once the selected program is recorded,  
remote media server 24 or local media server 29 may  
provide a copy of user directory 59 to the program  
guide if the program guide maintains a copy of user  
directories. Alternatively, remote media server 24 or  
40 local media server 29 may provide a pointer to the  
30 location of the program on media store 63. In still  
another suitable approach, user directories 59 may be

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10 maintained solely by remote media server 24 or local media server 29 and provided to the program guide on request.

In practice, some programs may be copy  
5 protected. Main facility 12, program guide  
15 distribution facility 16, or another distribution facility may, for example, designate some programs as not recordable. When the user indicates a desire to record a copy protected program, the program guide may  
20 indicate to the user that the program cannot be recorded as shown in FIG. 16.

The program guide may provide the user with  
25 the opportunity to access a directory or other such list of programs that have been recorded for the user  
15 on remote media server 24 or local media server 29.  
The user may indicate a desire to access a directory or  
30 list of recorded programs by, for example, pressing a "DIR" key on remote control 40 or selecting a "Directory" feature from main menu 107. FIGS. 18a and  
20 18b show illustrative overlays 320 that may be displayed by the program guide when the user indicates  
35 a desire to view a directory of the programs that the user has recorded on remote media server 24 or local media server 29. FIG. 18a shows overlay 320 overlaid  
25 on top of the video of the channel that the viewer is watching. FIG. 18b shows overlay 320 overlaid on top of a program listings screen. Overlay 320 may display any information related to the programming that the user  
40 has selected for recording by remote media server 24 or  
45 local media server 29. Overlay 320 may display, for  
30 example, the channels and titles of the recorded

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10 programs, the dates and times they are recorded, or any other suitable information.

15 Program listings for recorded programs may be organized by channel, theme, user, or by any other suitable criteria. In practice, program listings for recorded programs may be displayed in overlays based on the type of display screen over which the overlays are displayed. In FIG. 18b, for example, listings are displayed by time because the display screen over which

20 they are displayed displays program listings by time. FIG. 18c shows listings of recorded programs in the movies category, because the display screen over which they are displayed only displays listings for movies.

25 FIGS. 18b and 18c are illustrative and any suitable criteria may be used. In addition, program listings may be displayed using display criteria or based on themes when the program listings are overlaid on top of

30 a video the user is watching.

35 FIG. 18d shows an illustrative directory screen 350 that may be displayed by the program guide when the user indicates a desire to view a directory of the programs that the user has recorded on remote media server 24 or local media server 29. Directory screen 350 may display program-related information like that displayed by overlay 320. Directory screen 350 may also include other program guide display screen elements, such as selectable advertisements, service provider logos, brand logos, advertisement banners, etc. If desired, directory screen 350 may be displayed

40 as an overlay and any of the overlays described herein may be presented as display screens. Such display screens may be either full screen display screens or

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10 partial screen display screens. Partial screen display screens may contain a reduced-size video window (e.g., for displaying the current television channel).

15 In another suitable approach, the program  
5 guide may display a directory menu when the user, for example, presses a "DIR" key on remote control 40 or selects a "Directory" feature from main menu 102. An illustrative directory menu screen 370 is shown in FIG 18e. Directory menu screen 370 may provide the  
20 user with an opportunity to view directories of recorded programs, such as that shown in FIG. 18d, but sorted in various ways. When, for example, the user selects "By Time" feature 371, the program guide may display a directory of recorded programs assorted  
25 according to the date and time the programs were recorded. When, for example, the user selects "Movies" feature 373, "Sports" feature 375, "Children" feature 377, or "Adult" feature 379, the program guide may display a directory of recorded programs for movies,  
30 sports, children's programs, or adult programs,  
20 respectively. The listed categories may be predetermined or based on movies a user has recorded. For example, if a user has only recorded movies, only  
35 "Movies" feature 373 may be displayed. If a user has recorded movies and children's programs, "Movies"  
40 feature 373 and "Children" feature 377 may be displayed.

45 The program guide may also provide the user with an opportunity to view a directory of programs  
30 that the user has selected for recording by a media server but that have not yet been recorded. FIG. 18f shows an illustrative pending program directory screen

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380 that the program guide may display when, for  
example, the user selects "Pending Selections" feature  
381 from directory menu screen 370.

The information displayed in the listings  
15 5 screens of FIGs. 11a, 11b, 11c, 12a, and 12b (FIGS. 18a  
and 18b), in overlay 320, or in directory screens 350  
or 390 (FIGS. 18d and 18f), may be obtained by the  
program guide using any suitable approach. For  
example, a copy of user directory 59 having all of the  
20 10 displayed information may be stored by the program  
guide in memory 49. In still another suitable  
approach, a copy of user directory 59 may be maintained  
by the program guide that includes all program guide  
data related to the recorded program (e.g., program  
25 15 listings information, Internet links, software, etc.),  
while a copy of user directory 59 having a small subset  
of the total program guide data available for the  
program (e.g., a program identifier and pointer) is  
30 maintained by remote media server 24 or local media  
server 29. In still another suitable approach, the  
35 20 program guide may maintain user directory 59 including  
the program guide data for the programs in the  
directory. Alternatively, a smaller directory may be  
maintained having only program identifiers, for  
40 25 example, and the program guide may obtain program guide  
data from a continuously provided program guide data  
stream from program guide distribution facility 16 or  
from program guide server 25 based on the identifier.  
In still another suitable approach, user directory 59  
45 30 may be totally maintained by remote media server 24 or  
local media server 29 and made available to the program  
guide on demand. These various approaches are only

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10                   illustrative and any suitable approach for maintaining user directories and providing users with access to them may be used if desired.

15                   Once the user has selected for playback a program recorded on remote media server 24, the program guide may indicate to the user a charge for playing back the program and prompt the user to confirm the playback. FIG. 19 shows an illustrative overlay 1901 in which such a charge is indicated and in which the 20 user is prompted to confirm the playback. The charge displayed in overlay 1901 may be determined using any suitable approach. Users may be charged a flat rate per-playback. Alternatively, users may be charged based on how long a selected program is. In another 25 suitable approach, users may subscribe to a service in which users are permitted unlimited playback time for a flat fee paid on a periodic basis (e.g., monthly). In still another suitable approach, users may be charged a flat rate for a predetermined amount of playing back 30 programs. The charge may be provided by program guide distribution equipment 16 to billing system 199 for 35 billing the user or otherwise adjusting the user's account.

40                   Once the user has selected a listing and indicated a desire that its associated program be played back (and if necessary confirmed the playback), the program guide may issue a play back request to remote media server 24 or local media server 29. If desired, the program may be played back without 45 commercials. The program guide may, for example, provide the user with the opportunity to set a "skip commercials" option from a set-up screen.

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- 10 Alternatively, the user may fast-forward through commercials.
- 15 If desired, the program guide may instead issue a retrieval request to remote media server 24.
- 20 5 In contrast to a play back request that directs remote media server 24 to both retrieve and play back the requested program, a retrieval request need not involve immediate play back. Rather, the requested program may be retrieved from storage 15 and provided to user television equipment 22. As used herein, "retrieval request" is intended to mean any command, request, message, remote procedure call, object based communication or any other type of interprocess or interobject based communication whereby the program
- 25 10 guide may communicate information to the remote media server 24 or local media server 29 specifying which program the user wishes to retrieve. The retrieved program may then be stored in memory 44 (FIG. 6), digital storage device 31 (FIG. 6), secondary storage device 32 (FIG. 6) or on local media server 29 (FIG. 6). When the user wishes to view the program that has been retrieved and locally stored, user television equipment 20 may be directed to play back the program. If the retrieved program is stored on
- 30 25 local media server 29, the user television equipment can retrieve it and then play it or may request that local media server 29 play it back directly.

35 The program guide may provide users with the opportunity to view additional information for programs recorded by remote media server 24 or local media server 29. FIG. 20 shows an illustrative full information screen 161 that may be displayed when a

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10 user indicates a desire to view information for a program that has been recorded by remote media server 24 or local media server 29. Full information screen 161 may be displayed, for example, when the user  
15 presses an "INFO" key on remote control 40 after highlighting a program listing in a directory or other list of recorded programs.

20 Full information screen 161 may include information window 162, in which a brief description of  
10 the recorded program may be displayed. The information displayed in information window 162 may have been stored by remote media server 24 or local media server 29 when the program was recorded, may have been stored by the program guide when the program was  
25 recorded, may be retrieved by the program guide when full information screen 161 is displayed, or may be obtained by the program guide using any other suitable approach.

30 The program guide may provide users with the opportunity to play programs on demand that users have previously recorded on remote media server 24 or local media server 29. Remote media server 24 or local media server 29 may play programs on-demand in response to playback requests generated by the program guide. As  
35 used herein, "playback request" is intended to mean any command, request, message, remote procedure call, object based communication, or any other type of interprocess or inter-object based communication whereby the program guide may communicate information  
40 to a media server specifying which program the user wishes to play back. The program guide may generate playback requests when a user indicates a desire to  
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10 view a program that has been recorded. The user may indicate a desire to view a program that has been recorded by, for example, highlighting a listing in a directory or list and pressing a "PLAY" key on remote control 40.

15 When the user indicates a desire to view a program that has been recorded, the program guide generates a playback request that is transmitted by communications device 51 to remote media server 24 or local media server 29 via communications path 20 or 31.

20 The playback request may include for example, an identifier for the program that the user wishes to play back, an identifier for the user, etc. The playback request may include a pointer to a media directory on storage 15 if, for example, the program guide maintains a user directory 59 or a copy of a user directory 59.

25 Remote media server 24 retrieves the requested program from storage 15 and provides it to distribution equipment 21 for distribution as a suitable video signal (e.g., NTSC video, MPEG-2, etc.). Local media server 29 may retrieve the requested program from storage 37 and provide it to user television

30 equipment 22 as a suitable video signal (e.g., NTSC video, MPEG-2, etc.). If the requested program is to be played back, distribution equipment 21 distributes the program in real time. If the requested program is merely being retrieved, distribution equipment 21 may transfer the program to user television equipment 21 in a compressed format (e.g., as a compressed video file).

35 40 45 50 55  
Remote media server 24 may also retrieve any recorded program guide data associated with a recorded program and may provide the retrieved data to

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10 distribution equipment 21 or program guide server 25  
for access by the program guide. Alternatively, remote  
media server 24 may provide the retrieved data directly  
to the program guide. Local media server 29 may  
15 5 provide the data to user television equipment 22 via  
communications path 29. The program guide may access  
the retrieved program guide data and may present it to  
the user so that the user may interact with the data  
during playback just as when the program was originally  
20 10 aired. If, for example, associated program data is  
computer software that the user could have accessed  
when the program was originally aired, the software may  
be downloaded by the program guide in response to an  
25 15 indication from the user that the user desires to  
access the software.

30 The software may be stored on, for example,  
digital storage device 49, so that the user can access  
the software during playback. Such software may be,  
35 20 for example, an interactive television application,  
such as a shopping application that allows the user to  
place orders for goods offered during the program.

35 Another example of program guide data that  
may be stored is an Internet link that is associated  
with a recorded program. The link may be retrieved by  
40 25 remote media server 24 or local media server 29 and  
downloaded by the program guide when the user plays  
back the program. The program guide may display the  
link in a program guide display screen or overlay.  
45 30 Internet links may, for example, be displayed in an  
overlay that is displayed on top of the program during  
playback. The program guide may provide the user with

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10 the opportunity to select the Internet link and thereby direct the program guide to launch a web browser.

15 The program guide may provide a user with an opportunity to parentally control programs and program  
5 guide data. The program guide may, for example, provide a user with an opportunity to set a parental control code and parental control criteria (e.g., rating, title, channel, etc.) When a user indicates a desire to record a program on or play back a program  
20 from remote media server 24 or local media server 29, the program guide may compare the characteristics of the program (e.g., its rating, title, channel, etc.) stored, for example, in a user directory, with the parental control criteria. If the program does not  
25 meet the criteria (e.g., its rating is too mature), the program guide may prompt the user for the parental control code. The program guide may allow the user to record or playback the program only when the proper parental control code is entered. FIG. 21 shows an  
30 20 illustrative overlay 2111 that the program guide may display over a television channel or program guide display screen to prompt the user for parental control code. FIG. 21 shows overlay 2111 displayed over a television channel which has had an objectionable  
35 25 program blacked out by the program guide.

40 The program guide may provide the user with VCR like control of recorded programs. Remote control  
45 40 may have keys that resemble the buttons on a typical analog videocassette recorder. In another suitable  
30 approach, user input device 46 (FIG. 9) may have a keyboard with keys mapped to VCR like functions.  
Alternatively, the user may select on-screen features

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10 that correspond to such functions. Any other suitable approach for providing the user with VCR like control of recorded programs may be used. The user may, for example, pause, stop, rewind, fast-forward, or play the  
5 program by indicating a desire to do so (e.g., by pressing suitable keys on remote control 40).  
15

15 These features may be performed locally by  
the program guide, for example, by downloading on-  
demand programming in part or in whole to digital  
20 storage device 49 (FIG. 9). Alternatively, the program  
guide may generate appropriate requests (e.g., fast-  
forward, rewind, skip, and pause requests) in real time  
in response to user input. Such requests may be  
25 transmitted to remote media server 24 or local media  
server 29 for processing. As used herein, requests for  
VCR-like control of recorded programs are intended to  
mean any command, request, message, remote procedure  
30 call, object based communication, or any other type of  
interprocess or inter-object based communication  
35 whereby the program guide may communicate information  
to the media server specifying which program the user  
wishes to control.

FIG. 22 shows an illustrative overlay 2201 for providing users with VCR-like control of programs that have been recorded on remote media server 24 or local media server 29. When a user indicates a desire to stop, play, fast-forward, rewind, or pause a video by, for example, pressing suitable keys on remote control 40, the program guide may indicate which key has been pressed. For example, if the user fast-forwards a video, the program guide may highlight the "FAST FORWARD" button portion of overlay 2201.

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10                 The program guide may also provide users with  
an opportunity to real-time cache programs. This  
15                 feature may allow users to view portions of a program  
that the user would otherwise not be able to view when,  
5                 for example, the user must momentarily leave the room  
in which the program is being shown. A user may  
15                 indicate a desire to record a program on remote media  
server 24 when viewing is interrupted by, for example,  
pressing a "PAUSE" key on remote control 40. The  
20                 program guide may respond for example, by indicating to  
the user a charge for caching the program and prompting  
the user to confirm the recording as shown in FIG. 23.  
Once the user has confirmed the record or if there is  
25                 no charge for the record, the program guide may issue a  
15                 record request to remote media server 24. Remote media  
server 24 may begin recording the program at that point  
and until the program is finished. When the  
30                 interruption is over (e.g., the user returns to his or  
her seat), the user may indicate a desire to continue  
20                 watching the program. Remote media server 24 may play  
back the cached copy of the program while continuing to  
cache the remaining portion of the aired program until  
the aired program is over. The user may catch up to  
35                 the aired program during commercials or other progress  
25                 of little interest by, for example, fast-forwarding.

40                 When a user indicates a desire to "rewind" a  
real-time cached program to the point before which the  
user began recording, remote media server 24 may check  
storage 15 to see if any other users have recorded the  
45                 30 program or whether the program is otherwise still  
available. If there are no other copies of the program  
available, the user may be restricted to rewinding only

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10 to the point at which the user began recording. If  
desired, remote media server may automatically cache or  
otherwise temporarily record all current programs,  
programs being viewed, or programs for certain  
15 subscribers thereby providing users or subscribers with  
the ability to have full VCR-like control of such  
cached or recorded programs. Local media server 29 may  
cache programs in a similar manner if desired.

20 The program guide may also provide users with  
an opportunity to manage what is stored on remote media  
server 24 and local media server 29. The program guide  
may, for example, provide users with an opportunity to  
delete programs that are no longer desired. The user  
25 may indicate a desire to delete a program by, for  
example, highlighting a listing for a recorded program  
and pressing a "DEL" key on remote control 40, by  
selecting an on-screen feature of a program guide  
30 display screen such as feature 159 of full information  
screen 161 (FIG. 20), or using any other suitable  
20 approach. When the user indicates a desire to delete a  
recorded program, the program guide may generate a  
delete request that is transmitted to remote media  
server 24 or local media server 29 by communications  
35 device 51. Delete requests may be any suitable  
request, message, object-based communication, remote  
procedure call, etc.

40 After receiving a delete request, remote  
media server 24 (for users from within the same or  
different households) or local media server 29 (for  
45 users from within the same household) may determine  
30 whether more than one user has requested a copy of the  
selected program. If only one user has requested that

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the program be recorded, remote media server 24 may issue a delete command to the storage device that stores the program selected for deletion. The appropriate storage device deletes the selected program from its media store 63 (FIG. 4) and media directories 61 and user directory 59 are updated accordingly. If more than one user has requested that the program be recorded, remote media server 24 may delete the entry in user directory 59 for that program. If the program guide maintains a user directory 59, the program guide may delete the entry. Local media servers may delete programs in a similar manner.

Remote media server 24 and local media server 29 may automatically delete programs if desired. This may be done, for example, when a program is not accessed by a user for a predetermined period of time. Remote media server 24 and local media server 29 may also automatically delete portions of a program that is being real-time cached. For example, real time caching may be limited to ten minutes of recording, thereby limiting the amount of recording a user may rewind. Remote media server 24 may, for example, move a program to physical media that is sent to the user. Another suitable approach involves deleting programs after all users have watched them. Users may be charged a fee for recording programs on server 29 or server 24. If users are charged a fee, users may be charged per unit of storage consumed, per program recorded, per playback, or may be charged a flat fee, etc.

The program guide may provide a user with an opportunity to set up various settings related to how programs are recorded on or played back from remote

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10 media server 24 or local media server 29. The program  
indicates a desire to set up these features by, for  
example, selecting a "Setup" feature from main menu  
5 102. An illustrative setup screen 2401 is shown in  
FIG. 24.

15 As shown in FIG. 24, the user may set the  
audio language, audio format, and video format that  
user television equipment 22 may play programs in. The  
20 user may change settings by, for example, arrowing  
right or left. The user may change between settings  
by, for example, arrowing up or down. Suitable audio  
formats may include mono, stereo, surround sound, etc.  
25 Suitable video formats may include regular, high  
15 definition television (HDTV), wide screen, narrow  
screen, etc. The user may also select the language in  
which programming audio is played if available on a  
30 digital audio track.

20 The program guide may include the selected  
language, audio format, and video format in record  
35 requests. Remote media server 24 or local media server  
29 may record programs with only those indicated  
formats and languages if they are available as part of  
40 program data associated with the programs.

45 25 Alternatively, the program guide may include the  
selected language, audio format, and video format in  
playback requests. Remote media server 24 or local  
media server 29 may record programs with all available  
30 video and audio formats and languages and may playback  
programs only in the selected formats and language (or  
any default format or language) when requested.

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The program guide may also allow the user to define "super-programs." Super-programs are sequences of programs or program segments that the guide will play back sequentially in a specified order. Recording super-programs on digital storage using interactive television program guides is described, for example, in the above-mentioned Hassell et al. United States patent application Serial No. 09/157,256. The user may indicate a desire to access the super-program feature of the program guide by, for example, entering appropriate commands with user input device 46. If user input device 46 is a remote control such as remote control 40 of FIG. 8, the user may, for example, use a "SUPER" key on remote control 40 after highlighting a program listing in directory listing screen 350 (FIG. 18d), or may select an on-screen "Super-Program" option from a program guide display screen or from a list of on-screen options that are provided by the program guide when a program listing is selected.

The program guide may also provide the user with the ability to name super-programs and to store them on remote media server 24, local media server 29, or optional digital storage device 49. Entries for the named super-programs may be kept in user directories maintained by remote media server 24, local media server 29, or the program guide and may be displayed in any suitable screen that lists directory entries for programs (e.g., directory screen 350 of FIG. 18d). Alternatively, the program guide may list super-program listings in a super-program directory screen (i.e., a directory screen dedicated to listing super-program listings). For example, when directory screen 350 is

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10 displayed by the program guide, the program guide may provide the user with an opportunity to select a named super-program.

15 When the user selects a named super-program,  
5 the program guide may generate a super-program screen for display on display device 45. The program guide may also provide the user with an on-screen list of options for performing super-program functions (e.g., playing, transferring or editing the super-program).

20 When the user indicates a desire to define a super-program, the program guide generates a super-program screen for display on display device 45. An illustrative super-program screen 130 is shown in FIGS. 25a and 25b.

25 15 Super-program screen 130 may be organized into three areas. Area 131 displays a directory of programs recorded by remote media server 24, local media server 29, digital storage device 49, or any combination thereof. Area 132 indicates the super-program sequence. Video feedback area 137 displays portions of programs included in the super-program.  
30 20 The time remaining for recording may be displayed, for example, to indicate to the user how much time is left on remote media server 24 or local media server 29 for recording in approaches where there are limits on user recording.

35 45 The three areas of super-program screen 130 may be presented only when needed. For example, area 131 may be displayed only when the program guide is 30 providing the user with an opportunity to select a recorded program. Once the user has selected a program, area 131 may be removed and area 132 may be

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10 displayed in its place, while the program guide is providing the user with an opportunity to define a program segment for inclusion in the super-program. Video feedback area 137 may be displayed only in  
15 5 response to an indication by the user to the program guide to display a program segment. Thus, it may not be necessary for all three areas to be displayed at once.

20 To define a super-program, the user indicates 10 which programs are to be included in the super-program sequence. The program guide may also give the user the ability to include in the current super-program other previously defined super-programs. Area 131 lists the recorded programs and super-programs. If the user  
25 15 interface is a remote control such as remote control 40 of FIG. 8, the user may use up and down arrow keys to select a desired program or super-program. The user may also access other information associated with the entry by using an "INFO" key on remote control 40, or  
30 20 by selecting a suitable option from an on-screen options list provided by the program guide. The program guide may generate a full information screen such as full information screen 161 of FIG. 20,  
35 containing information associated with the selected 25 program when the "INFO" key is pressed.

40 Whenever the user selects a program, the program guide places the selected entry in the super-program sequence at a defined point in the sequence (e.g., at the end of the sequence). As shown in  
45 30 FIG. 25a, for example, a first segment entry, "Braveheart," has already been selected by the user. The user is currently selecting the second segment

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10 entry, "Kiss The Girls." The segment entries are listed in second area 132. The user then has the option of defining the play segment of the program to be played. Indicators 135 indicate the currently defined play segment.

15 If the user wishes to define a play segment, the user may do so, for example, by using markers 136 (FIG. 25b) to define the segment by moving the markers to the desired time within a program. As shown in FIG. 20 25b, the user uses highlight region 134 (positioned by the program guide over one of the markers) to move markers 136 to define the play segment. The program guide may display the portion of the program corresponding to markers 136 in video feedback area 137 25 as markers 136 are individually positioned. The program guide may, for example issue playback requests to remote media server 24 or local media server 29 that include a user pointer to the desired position in the program or off-sets from the current position.

30 20 Alternatively, the program guide may send suitable requests to remote media server 24 or local media server 29 to adjust one or more user pointers on remote media server 24 or local media server 29. When the user is finished defining the play segment, the user 35 25 may press an "OK" key on remote control 40. In response, the program guide positions highlight region 134 (FIG. 25a) in first area 131 to allow the user to define another entry in the super-program sequence.

40 45 When the user has finished defining the super-program, the user may issue appropriate commands 30 with user input device 46. If user input device 46 is a remote control such as remote control 40 of FIG. 8,

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10                         the user may use a "PLAY" key to finish editing the  
super-program and play the super-program. The user may  
also select an on-screen "Play" feature from a list of  
on-screen options provided by the program guide. The  
5                         user may play the super-program at any time after the  
super-program has been defined.

15                         When the user presses "PLAY", the program  
guide may issue a playback request to remote media  
server 24 or local media server 29, or may issue the  
20                         appropriate instructions to digital storage device 49  
to read the programs and associated program data  
according to the defined super-program sequence. The  
playback requests may, for example, contain pointers  
25                         to the positions in the programs that are defined by  
the super-program sequence. The program guide then  
instructs user television equipment 22 to provide the  
programs in the super program and any associated data  
30                         in the appropriate format for display on display device  
45 and for use by the user as if the user were viewing  
20                         the programs when they were originally aired. If  
display device 45 is a television, for example, user  
television equipment 22 may convert the programs from  
their digital format to appropriate RF or demodulated  
35                         video signals for display on monitor 45.

40                         The user may store the super-program for  
playback at a later time. The user may indicate a  
desire to postpone playback by, for example, issuing  
appropriate commands with user input device 46. If  
user input device 46 is a remote control such as remote  
45                         control 40 of FIG. 8, the user may use an "EXIT" key on  
30                         remote control 40 or select an on-screen "Exit" option.  
The program guide may respond to an indication to

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10 postpone playback by storing the playback sequence  
(either in memory 63, on digital storage device 49,  
remote media server 24 or local media server 29. The  
user may later access the super-program by, for  
15 example, selecting the super-program while in directory  
screen 350. The program guide may then generate a  
super-program screen with the previously entered  
selections and defined play-segments and provide the  
user with the opportunity to add, edit or re-order the  
20 programs and program segments. The user plays the  
super program by issuing a suitable command (e.g.,  
pressing a "PLAY" key on remote control 40).

25 FIGS. 26-31 are illustrative flowcharts of  
steps involved in operating the system of the present  
15 invention. The steps shown in FIGS. 26-31 are  
illustrative and may be performed in any suitable  
order. Various steps may also be deleted if desired.

30 FIG. 26 is an flowchart of an illustrative  
overview of steps involved in recording programs and  
20 program guide data on remote media server 24 or local  
media server 29. At step 2610, the program guide  
provides the user with an opportunity to select a  
35 program for recording on remote media server 24 or  
local media server 29. This may be accomplished by,  
25 for example, providing a user with an opportunity to  
record a program while watching it, whether directly or  
in combination with a FLIP overlay. This may also be  
accomplished by providing a user with an opportunity to  
40 select a program listing. Program listings may be  
30 presented by the program guide in various types of  
program listings screens, such as program listings by  
time screen 130 (FIG. 11a), program listings by channel

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10 screen 135 (FIG. 11b), program listings by category screen (FIG. 11c), in a Browse overlay or in any other suitable type of program guide display screen.

5 Alternatively, the user may access program listings via the Internet such as in the arrangement of FIG. 2e.

15 The user may also record programs by pressing a "PAUSE" or "REWIND" key on remote control 46 while watching a program to cache the program in real time.

20 Users may also select programs for recording 10 by remote media server 24 or local media server 29 by setting up search queries that define types of programs the user wants to record. The user may, for example, define boolean expressions that result in recording programs based on a suitable parameter or parameters.

25 15 Suitable parameters may include any program guide data associated with programs, such as program titles, actors within programs, program themes or categories, program ratings, text within program information fields, or any other suitable program guide data.

30 20 When the user selects or designates a program for recording, the program guide generates a record request (step 2620). This step may be performed concurrently with step 2610, immediately after step 2610, or sometime in the near future after step 2610

35 25 such as just prior to a program starting. When a user indicates a desire to record a program grouping, the request may include a grouping identifier or the program identifiers of the constituent programs. In still another approach, the program guide may generate 40 30 separate record requests for each program in the grouping, repeating step 2620.

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10                 The one or more record requests are transmitted to the recording media server at step 2640. Transmitting the record request may involve using any suitable communications protocol stack. Record  
15                 5 requests may be transmitted using, for example, TCP/IP, IPX/SPX, DOCSIS, or any other suitable protocol or group of protocols. If users are charged for recording, program guide distribution equipment 16 may provide billing information to billing system 199 (FIG.  
20                 10 1) at step 2650. The billing information may include the title of the program that was selected, its identifier, its length, the charge for the record, or any other suitable information. Billing system 199 may  
25                 25 bill the requesting user or adjust the user's account  
15 at steps 2655 and 2657, respectively.

30                 At steps 2660 and 2680, the program and associated program guide data are recorded on the recording media server, respectively. Steps 2660 and 2680 may be performed in any suitable order and may be  
35                 20 performed concurrently if desired. Step 2660 may include recording program associated data. Step 2680 may also be performed automatically by remote media server 24 or local media server 29 such as when automatically real-time caching programs.

40                 25 FIG. 27 is a somewhat more detailed flowchart of illustrative steps involved in recording programs, program guide data, or any combination thereof, on remote media server 24 or local media server 29 (e.g., steps 2660 and 2680 of FIG. 26). At step 2810, record  
45                 30 requests are received by remote media server 24 or local media server 29. The record requests are queued in a job queue at step 2820. At step 2840, similar

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10 requests are consolidated. The consolidated and unconsolidated requests are queued at step 2860.

15 The job queue may be examined at step 2880 to determine if enough users have requested each program  
5 for recording. Job queue entries may be examined, for example, 15 minutes before a program is scheduled to air. If too few users requested a given program, the users who requested the program may be notified (step 2890) and the program guide may record the  
20 program locally by using, for example, local media server 29, optional digital storage device 49 (FIG. 9), or optional secondary storage device 47 (FIG. 9) (step 2900). Alternatively, programs may be recorded on physical media and sent to users (step 2905).

25 15 At step 2910, suitable equipment at program guide distribution facility 16 (e.g., distribution equipment 21) tunes to the channel (analog or digital) on which the requested program is carried. This may be done, for example, in response to a request by remote  
30 20 media server 24. At step 2920, the program is recorded in analog or digital format on storage in remote media server 24 or local media server 29.  
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40 45 User directories may be updated at step 2940. User directories may be maintained by remote media server 24, local media server 29, by the program guide, or any combination thereof. User directories that are maintained by remote media server 24 or local media server 29 may be updated at step 2945. Local media server 29 may maintain a user directory for only those  
45 30 programs that it records on storage 37 (FIG. 7), or may maintain a copy of the user directories maintained by

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remote media server 24 for one or more users of a local  
10 media server 29.

The program guide may maintain user  
directories for one or more users locally in memory 63  
15 (FIG. 9), on optional digital storage device 49, or on  
optional secondary storage device 47 (step 2950). The  
user directories maintained by the program guide may  
reflect the programs stored by remote media server 24,  
local media server 29, or both, and may also be  
20 maintained by the program guide on local media server  
29 if desired. It may be desirable for the program  
guide to exclusively maintain user directories. In  
another suitable approach, however, the program guide  
25 may maintain copies of user directories that are  
15 maintained by remote media server 24 and local media  
server 29. Alternatively, user directories may be  
maintained exclusively by remote media server 24 or  
30 local media server 29 and provided to the program guide  
on-demand.

20 FIG. 28 is a flowchart of an illustrative  
35 overview of steps involved in playing back programs,  
program guide data, or any combination thereof, from  
remote media server 24 or local media server 29. At  
step 2700, the program guide provides the user with an  
25 opportunity to select the recorded program for playback  
from remote media server 24 or local media server 29.  
This may be accomplished by, for example, presenting  
the user with a directory of recorded programs. The  
directory may be overlaid on top of a television  
40 30 program that the user is watching (e.g., as with  
overlay 320 of FIG. 18a), may be overlaid on top of a  
program guide display screen (e.g., as with overlay 320

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10 of FIGS. 18b and 18c), may be displayed within a dedicated program guide display screen (e.g., as with directory screen 350 of FIG. 18d), or may be displayed within a web page such as in the arrangement of FIG.  
15 5 2e. Alternatively, users may be presented with program listings for recorded programs or programs selected for recording in regular program listings screens such as shown in FIGS. 11a, 11b and 11c.

20 The user may select or designate a program  
10 for playback by, for example, selecting the listing for the program from a list or other program guide display screen. After the user designates a program for playback (e.g., by selecting a listing and pressing a "PLAY" key on remote control 40), the program guide  
25 15 generates a playback request that is transmitted to remote media server 24 or local media server 29 (steps 2720 and 2740). Playback requests may be transmitted using, for example, TCP/IP, IPX/SPX, DOCSIS, or any other suitable protocol or protocols. If users are charged for playing back programs, program guide distribution equipment 16 may provide billing information to billing system 199 (FIG. 1) at step  
30 20 2750. The billing information may include the title of the program that was selected, its identifier, its  
35 25 length, the charge for the play back, or any other suitable information. Billing system 199 may bill the requesting user or adjust the user's account at steps 2755 and 2757, respectively. At steps 2760 and 2780, the program and associated program guide data are  
40 30 45 played back from the recording media server and presented to the user (e.g., on the user's television 36 of FIG. 7 or PC 231 of FIG. 2e).

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10 FIG. 29 is a somewhat more detailed flowchart  
of illustrative steps involved in playing back programs  
from remote media server 24 and local media server 29.  
At step 2960, a portion of a program selected for  
15 5 playback is cached by remote media server 24 or local  
media server 29. It may be desirable, for example, to  
cache the entire program if system resources permit.  
Step 2960 may also include step 2965 at which remote  
20 media server 24 or local media server 29 determines  
whether the portion of the program has already been  
cached (i.e., for another user). If so, an additional  
copy may not be needed.

25 At step 2980, remote media server 24 or local  
media server 29 distributes the program to user  
30 15 television equipment 22 for playback. The programs and  
their associated program guide data are played back on  
user television equipment 22 or PC 231 at step 2990.  
Programs and program guide data may be distributed and  
35 20 played back using any suitable approach. For example,  
programs and program guide data may be played back by  
media server 24 and distributed to user television  
equipment 22 for viewing in real-time. If programs and  
35 35 program guide data are distributed as digital data  
stream, user television equipment 22 may decode the  
40 25 data stream in real time. Such on-demand programs and  
program guide data may be distributed and played back  
according to preferences that were set up by the user.  
In a second suitable approach, programs and program  
45 30 guide data are distributed as one or more digital files  
or as a digital data stream, and are stored by user  
television equipment 22 for playback. In a third  
suitable approach, programs and program guide data are

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10 played back by remote media server 24 and distributed according to a schedule over an analog or digital channel using a suitable near-video-on-demand (NVOD) approach. In still another suitable approach, remote  
15 media server 24 may record programs and program guide data on physical media, such as a DVD or videocassette, that are sent to the user. Any combination of these approaches, or any other suitable approach, may also be used.

20 10 At step 3000, the program guide provides the user with VCR-like control of the program. The program guide may display an overlay, such as overlay 141 of FIG. 22, to indicate to a user when the user has stopped, paused, rewound, or fast-forwarded the  
25 15 program. At step 3010, remote media server 24 or local media server 29 may adjust the user pointer within a program portion, or may move the pointer to the next program portion. User pointers may be advanced, for example, as a program is played back normally, or when  
30 20 a program is being controlled such as when it is being fast-forwarded. At a suitable point before a user pointer is adjusted beyond the beginning or end of a program portion, the previous or next program portion may be cached (step 2960). Program guide data may be  
35 25 presented and represented so that it tracks the program being controlled by the user using the interactive television program guide.

40 45 FIG. 30 is a flowchart of illustrative steps involved in providing the user with access to real-time  
45 30 cached copies of programs. At step 3020, remote media server 24 or local media server 29 caches a program while it is being aired. Step 3020 may be performed by

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remote media server 24 or local media server 29 automatically, or may be performed when a user indicates a desire to cache a program in real-time (e.g., by pressing a "PAUSE" key on remote control 40 10 while watching a program). At step 3040, the program is played on user television equipment 22 while the user is provided with VCR-like control of the program. When the user indicates a desire to perform a VCR-like function, the program guide may issue a request to 15 remote media server 24 or local media server 29 to adjust the user pointer to the user's viewing position in the cached copy. When the user is finished viewing the cached copy, such as when the program is over, when the user fast-forwards to the end, or when the user 20 presses the stop key, the program guide may issue a delete request to remote media server 24 or local media server 29 to delete it, or it may be deleted 25 automatically.

Steps involved in providing the super-program 30 feature of the present invention are set forth in FIG. 31. The program guide records programs and associated program guide data on remote media server 24, local media server 29, or digital storage device 49 at step 3110. At step 3120, the super-program sequence 35 is defined. This may include displaying a super-program screen, such as super-program screen 130 of FIGS. 25a and 25b, on display device 45 as set forth in step 3140. Recorded programs are listed by the program guide on display device 45 at step 3160, and the 40 program guide provides a user with an opportunity to select the listed programs at step 3180. At step 3200, the program guide provides the user with an opportunity 45

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to define play segments. The program guide may display a play segment indicator and marker for defining the play segment, as indicated by step 3220. At step 3240, the program guide displays a video feedback area on display device 45. The program guide displays the programs, play segments, and associated program data which are part of the super-program sequence on display device 45 according to the super-program sequence at step 3260.

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5 The foregoing is merely illustrative of the principles of this invention and various modifications can be made by those skilled in the art without departing from the scope and spirit of the invention.

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**Claims**

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What is claimed is:

10           1. An interactive television program guide system in which television programs are recorded and played back on-demand for a number of users, the system comprising:

15           a remote media server configured to store and play back programs on-demand for each user; distribution equipment configured to distribute programs to each user that are played back on-demand with the remote media server for each user; and

20           interactive program guide television equipment on which an interactive television program guide is implemented and wherein the interactive television program guide is configured to:

25           generate a record request when a user indicates a desire to record a program on-demand with the remote media server; and

30           generate a playback request when a user indicates a desire to play back a program on-demand with the remote media server, and wherein the remote media server is further configured to:

35           record a program in response to the record request generated by the interactive television program guide; and

40           play back a program in response to the playback request generated by the interactive television program guide.

45           2. The system defined in claim 1 wherein: the interactive program guide television equipment comprises user television equipment; and

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10                         the interactive television program guide  
is further configured to display on the user television  
equipment a directory of program listings for programs  
recorded with the remote media server when a user  
indicates a desire to view a directory of program  
listings for programs recorded with the remote media  
server.

20                         3. The system defined in claim 1 wherein:  
                               the interactive program guide television  
                               equipment comprises user television equipment; and  
                               the interactive television program guide  
                               is further configured to display on the user television  
                               equipment a directory of program listings sorted by  
                               title for programs recorded with the remote media  
                               server when a user indicates a desire to view a  
                               directory of program listings sorted by title for  
                               programs recorded with the remote media server.

35                         4. The system defined in claim 1 wherein:  
                               the interactive program guide television  
                               equipment comprises user television equipment; and  
                               the interactive television program guide  
                               is further configured to display on the user television  
                               equipment a directory of program listings sorted by  
                               theme for programs recorded with the remote media  
                               server when a user indicates a desire to view a  
                               directory of program listings sorted by theme for  
                               programs recorded with the remote media server.

45                         5. The system defined in claim 1 wherein:

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10                   the interactive program guide television equipment comprises user television equipment; and

15                   the interactive television program guide is further configured to overlay a directory of program listings for programs recorded with the remote media server over a program that a user is watching on the user television equipment when a user indicates a desire to view a directory of program listings for programs recorded with the remote media server.

20                   6. The system defined in claim 1 wherein:  
                         the interactive program guide television equipment comprises user television equipment having storage;

25                   the interactive television program guide is further configured to generate a retrieval request when a user indicates a desire to play back a program recorded with the remote media server;

30                   the remote media server retrieves a program and provides it to the user television equipment in response to the retrieval request generated by the interactive television program guide; and

35                   the interactive television program guide is further configured to store the retrieved program on the storage for playback on the user television equipment.

40                   7. The system defined in claim 1 wherein:  
                         the interactive program guide television equipment further comprises user television equipment; and

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the interactive television program guide is further configured to display information about a program recorded with the remote media server when a user indicates a desire to view information about the program recorded with the remote media server.

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8. The system defined in claim 1 wherein:  
the interactive television program guide is further configured to generate a fast-forward request when a user indicates a desire to fast-forward a program that is being played back by the remote media server; and

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the remote media server is further configured to fast-forward the program in response to the fast-forward request generated by the interactive television program guide.

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9. The system defined in claim 1 wherein:  
the interactive television program guide is further configured to generate a rewind request when a user indicates a desire to rewind a program that is being played back by the remote media server; and

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the remote media server is further configured to rewind the program in response to the rewind request generated by the interactive television program guide.

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10. The system defined in claim 1 wherein:

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the interactive television program guide is further configured to generate a stop request when a user indicates a desire to stop a program that is being played back by the remote media server; and

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the remote media server is further configured to stop the program in response to the stop request generated by the interactive television program guide.

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11. The system defined in claim 1 wherein:  
the interactive television program guide is further configured to generate a pause request when a user indicates a desire to pause a program that is being played back by the remote media server; and  
the remote media server is further configured to pause the program in response to the pause request generated by the interactive television program guide.

25

12. The system defined in claim 1 wherein:  
the interactive television program guide is further configured to generate a record request when a user indicates a desire to cache a program with the remote media server; and

30

the remote media server is further configured to cache the program in response to the record request generated by the interactive television program guide when the user indicated a desire to cache a program.

40

13. The system defined in claim 1 wherein:  
the remote media server is further configured to automatically cache all current programs;  
the interactive television program guide is further configured to generate a playback request

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for a cached program when a user indicates a desire to view at least a portion of the cached program; and  
the remote media server is further configured to play back at least a portion of a cached program in response to a playback request for the cached program generated by the interactive television program guide.

15

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14. The system defined in claim 1 wherein:  
the interactive television program guide is further configured to generate a delete request when a user indicates a desire to delete a program recorded with the remote media server; and

25

the remote media server is further configured to delete the program in response to the delete request generated by the interactive television program guide.

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15. The system defined in claim 1 wherein  
the remote media server is further configured to automatically delete programs recorded with the remote media server.

40

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16. The system defined in claim 1 wherein:  
the interactive program guide television equipment further comprises user television equipment;  
the interactive television program guide is further configured to provide a user with an opportunity to define a super-program sequence and to generate at least one playback request according to the super-program sequence; and

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10                   the remote media server is further configured to play back at least a portion of a program in response to the at least one playback request generated by the interactive television program guide according to the super-program sequence.

15                   17. The system defined in claim 1 wherein:  
                       the interactive program guide television equipment comprises user television equipment having storage;

20                   the distribution equipment is further configured to transmit programs recorded with the remote media server as files; and

25                   the interactive television program guide is further configured to store the files on the storage for playback on the user television equipment.

30                   18. The system defined in claim 1 wherein:  
                       the interactive program guide television equipment comprises user television equipment

35                   the remote media server is further configured to store and play back on-demand program guide data associated with the programs stored by the remote media server; and

40                   the interactive television program guide is further configured to present program guide data on the user television equipment to a user as if an associated program were being originally aired.

45                   19. The system defined in claim 1 wherein  
                       the remote media server:

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10 consolidate multiple record requests for a program into  
a single job; and

is further configured to record a single copy of a program for multiple users according to the job.

20                   20. The system defined in claim 1 wherein  
the remote media server is further configured to  
determine whether a predefined number of users have  
indicated a desire to record a program and to record  
the program when at least the predefined number of  
users have indicated a desire to record the program.

25

30                         21. The system defined in claim 1 wherein  
                       the remote media server is further configured to  
                       determine whether a predetermined number of users have  
                       indicated a desire to record a program and to record  
                       the program on physical media that is sent to users who  
                       requested the program when less than the predetermined  
                       number of users have indicated a desire to record the  
                       program.  
35

40 22. The system defined in claim 1 wherein:  
the system further comprises a local  
media server configured to store and play back programs  
on-demand for at least one user;

the interactive television program guide  
is further configured to:

45 generate a record request when a user indicates a desire to record a program on-demand with the local media server; and

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generate a playback request when a user indicates a desire to play back a program on-demand with the local media server, and wherein the local media server is further configured to:

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record a program in response to the record request generated by the interactive television program guide; and

20

play back a program in response to the playback request generated by the interactive television program guide.

25

23. The system defined in claim 22 wherein: the interactive program guide television equipment comprises user television equipment; and

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the interactive television program guide is further configured to display on the user television equipment a directory of program listings for programs recorded with the local media server when a user indicates a desire to view a directory of program listings for programs recorded with the local media server.

35

24. The system defined in claim 22 wherein: the interactive program guide television equipment comprises user television equipment; and

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the interactive television program guide is further configured to display on the user television equipment a directory of program listings sorted by title for programs recorded with the local media server when a user indicates a desire to view a directory of program listings sorted by title for programs recorded with the local media server.

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10 25. The system defined in claim 22 wherein:  
the interactive program guide television  
equipment comprises user television equipment; and

15 the interactive television program guide  
is further configured to display on the user television  
equipment a directory of program listings sorted by  
theme for programs recorded with the local media server  
when a user indicating a desire to view a directory of  
program listings sorted by theme for programs recorded  
with the local media server.

20

25 26. The system defined in claim 22 wherein:  
the interactive program guide television  
equipment comprises user television equipment; and

30 the interactive television program guide  
is further configured to overlay a directory of program  
listings for programs recorded with the local media  
server over a program that a user is watching on the  
user television equipment when a user indicates a  
desire to view a directory of program listings for  
programs recorded with the local media server.

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40 27. The system defined in claim 22 wherein:  
the interactive program guide television  
equipment comprises user television equipment having  
storage;

45 the interactive television program guide  
is further configured to generate a retrieval request  
when a user indicates a desire to play back a program  
recorded with the local media server;

50 the local media server retrieves a  
program and provides it to the user television

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10 equipment in response to the retrieval request generated by the interactive television program guide; and

15 the interactive television program guide is further configured to store the retrieved program on the storage for playback on the user television equipment.

20 28. The system defined in claim 22 wherein: the interactive program guide television equipment further comprises user television equipment; and

25 the interactive television program guide is further configured to display information about a program recorded with the local media server when a user indicates a desire to view information about the program recorded with the local media server.

30 29. The system defined in claim 22 wherein: the interactive television program guide is further configured to generate a fast-forward request when a user indicates a desire to fast-forward a program that is being played back by the local media server; and

35 40 the local media server is further configured to fast-forward the program in response to the fast-forward request generated by the interactive television program guide.

45 50 30. The system defined in claim 22 wherein: the interactive television program guide is further configured to generate a rewind request when

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a user indicates a desire to rewind a program that is being played back by the local media server; and  
the local media server is further configured to rewind the program in response to the rewind request generated by the interactive television program guide.

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31. The system defined in claim 22 wherein:  
the interactive television program guide is further configured to generate a stop request when a user indicates a desire to stop a program that is being played back by the local media server; and

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the local media server is further configured to stop the program in response to the stop request generated by the interactive television program guide.

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32. The system defined in claim 22 wherein:  
the interactive television program guide is further configured to generate a pause request when a user indicates a desire to pause a program that is being played back by the local media server; and

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the local media server is further configured to pause the program in response to the pause request generated by the interactive television program guide.

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33. The system defined in claim 22 wherein:  
the interactive television program guide is further configured to generate a record request when a user indicates a desire to cache a program on the local media server; and

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the local media server is further configured to cache the program in response to the record request generated by the interactive television program guide when the user indicated a desire to cache a program.

15

34. The system defined in claim 22 wherein:  
the local media server is further configured to automatically cache all current programs;  
the interactive television program guide is further configured to generate a playback request for a cached program when a user indicates a desire to view at least a portion of the cached program; and

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the local media server is further configured to play back at least a portion of a cached program in response to the playback request for the cached program generated by the interactive television program guide.

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35. The system defined in claim 22 wherein:  
the interactive television program guide is further configured to generate a playback request for a program indicating a first user when a second user indicates a desire to record the program on the local media server for the first user; and  
the local media server is further configured to record the program for the first user in response to the playback request indicating the first user.

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36. The system defined in claim 22 wherein:

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10                   the interactive television program guide  
is further configured to generate a delete request when  
a user indicates a desire to delete a program recorded  
with the local media server; and

15                   the local media server is further  
configured to delete the program in response to the  
delete request generated by the interactive television  
program guide.

20                   37. The system defined in claim 22 wherein  
the local media server is further configured to  
automatically delete programs recorded with the local  
media server.

25                   38. The system defined in claim 22 wherein:  
                       the interactive program guide television  
equipment further comprises user television equipment;  
30                   the interactive television program guide  
is further configured to provide a user with an  
opportunity to define a super-program sequence and to  
generate at least one playback request according to the  
super-program sequence; and

35                   the local media server is further  
configured to play back at least a portion of a program  
in response to the playback request generated by the  
interactive television program guide according to the  
super-program sequence.

40                   45. The system defined in claim 22 wherein:  
                       the interactive program guide television  
equipment comprises user television equipment

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the local media server is further configured to store and play back on-demand program guide data associated with the programs stored by the local media server; and

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the interactive television program guide is further configured to present program guide data on the user television equipment to a user as if an associated program were being originally aired.

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40. The system defined in claim 22 wherein the remote media server is further configured to determine whether a predetermined number of users have indicated a desire to record a program and to direct the local media server to record the program when less than the predetermined number of users have indicated a desire to record the program.

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41. The system defined in claim 22 wherein: the interactive program guide television equipment comprises user television equipment having storage; and

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the remote media server is further configured to determine whether a predetermined number of users have indicated a desire to record a program and to direct the interactive television program guide to record the program on the storage when less than the predetermined number of users have indicated a desire to record the program.

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42. The system defined in claim 1 wherein: the interactive television program guide is further configured to provide a user with an

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opportunity to purchase a pay-per-view program and to generate a record request for the pay-per-view program; and

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the remote media server is configured to record the pay-per-view program in response to the record request for the pay-per-view program.

20

43. The system defined in claim 1 wherein:

the interactive television program guide is further configured to provide a user with an opportunity to purchase a pay-per-view program package having at least one pay-per-view program and to generate a record request for the pay-per-view program package that indicates each pay-per-view program; and

25

the remote media server is configured to record the at least one pay-per-view program in response to the record request for the pay-per-view program package.

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44. The system defined in claim 1 wherein:

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the interactive television program guide is further configured to generate a record request for a program grouping having at least one program when a user indicates a desire to record the program grouping with the remote media server; and

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the remote media server is configured to record the at least one program in response to the record request for the program grouping.

45

45. The system defined in claim 1 wherein the interactive television program guide is further configured to indicate to the user that a program

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cannot be recorded because the program is copy protected.

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46. The system defined in claim 1 wherein the interactive television program guide is further configured to prevent a user from selecting a program for recording by the remote media server when the program is copy protected.

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47. The system defined in claim 1 wherein the remote media server is further configured to record program associated data for a program in response to a record request for the program generated by the interactive television program guide.

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48. The system defined in claim 47 wherein the program associated data comprises interactive content.

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49. The system defined in claim 1 wherein:  
the interactive television program guide equipment comprises user television equipment; and  
the interactive television program guide is further configured to display on the user television equipment a directory of program listings for programs to be recorded with the remote media server when a user indicates a desire to view a directory of program listings for programs to be recorded with the remote media server.

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50. The system defined in claim 1 wherein:

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the interactive program guide television equipment comprises user television equipment; and  
10  
the interactive television program guide is further configured to display a program guide display screen having program listings for at least one program that is not recorded with the remote media server and program listings for at least one program that is recorded with the remote media server, when the user indicates a desire to view a program guide display screen having program listings.  
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51. The system defined in claim 1 wherein:  
the interactive program guide television  
equipment comprises user television equipment; and  
the interactive television program guide  
is further configured to display a program guide  
display screen having program listings for at least one program  
that is not recorded with the remote media  
server and program listings for at least one program  
that is to be recorded with the remote media server,  
when the user indicates a desire to view a program  
guide display screen having program listings.

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the billing information identifies  
a program that the remote media server recorded for the  
user in response to the record request; and

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the billing system charges the user  
based on a flat fee for recording a program with the  
remote media server.

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53. The system defined in claim 1 wherein:  
the system further comprises a billing  
system configured to charge a user for programs  
recorded with the remote media server for the user; and  
the remote media server is further  
configured to generate billing information used by the  
billing system when billing the user, wherein:

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the billing information indicates a  
program that the remote media server recorded for the  
user in response to the record request; and

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the billing system charges the user  
based on a flat fee for recording programs.

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54. The system defined in claim 1 wherein:  
the system further comprises a billing  
system configured to charge a user for programs  
recorded with the remote media server for the user; and  
the remote media server is further  
configured to generate billing information used by the  
billing system when billing the user, wherein:

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the billing information indicates a  
program that the remote media server recorded for the  
user in response to the record request; and

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the billing system charges the user  
based on the length of the program.

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10               55. The system defined in claim 1 wherein:  
the interactive program guide television  
equipment comprises user television equipment; and

15               the interactive television program guide  
is further configured to indicate to the user a charge  
for a program that the user has indicated a desire to  
record on remote media server, wherein the charge is  
based on a flat fee for recording a program with the  
remote media server.

20               56. The system defined in claim 1 wherein:  
the interactive program guide television  
equipment comprises user television equipment; and

25               the interactive television program guide  
is further configured to indicate to the user a charge  
for a program that the user has indicated a desire to  
record on remote media server, wherein the charge is  
based on a flat fee for recording programs.

30               57. The system defined in claim 1 wherein:  
the interactive program guide television  
equipment comprises user television equipment; and

35               the interactive television program guide  
is further configured to indicate to the user a charge  
for a program that the user has indicated a desire to  
record on remote media server, wherein the charge is  
based on the length of the program.

40               58. The system defined in claim 1 wherein:  
the system further comprises a billing  
system configured to charge a user for programs played  
back by the remote media server for the user; and

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10                   the remote media server is further configured to generate billing information used by the billing system when billing the user, wherein:

15                   the billing information indicates a program that the remote media server played back for the user in response to the playback request; and

20                   the billing system charges the user based on a flat fee for playing back a program with the remote media server.

25                 59. The system defined in claim 1 wherein:  
                     the system further comprises a billing system configured to charge a user for programs played back by the remote media server for the user; and

30                 the remote media server is further configured to generate billing information used by the billing system when billing the user, wherein:

35                 the billing information indicates a program that the remote media server played back for the user in response to the playback request; and

40                 the billing system charges the user based on a flat fee for playing back programs.

45                 60. The system defined in claim 1 wherein:  
                     the system further comprises a billing system configured to charge a user for programs played back by the remote media server for the user; and

50                 the remote media server is further configured to generate billing information used by the billing system when billing the user, wherein:

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the billing information indicates a program that the remote media server played back for the user in response to the playback request; and

the billing system charges the user based on the length of the program.

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61. The system defined in claim 1 wherein:  
the interactive program guide television equipment comprises user television equipment; and

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the interactive television program guide is further configured to indicate to the user a charge for a program that the user has indicated a desire to play back with the remote media server, wherein the charge is based on a flat fee for playing back a program with the remote media server.

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62. The system defined in claim 1 wherein:  
the interactive program guide television equipment comprises user television equipment; and

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the interactive television program guide is further configured to indicate to the user a charge for a program that the user has indicated a desire to play back with the remote media server, wherein the charge is based on a flat fee for playing back programs with the remote media server.

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63. The system defined in claim 1 wherein:  
the interactive program guide television equipment comprises user television equipment; and

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the interactive television program guide is further configured to indicate to the user a charge for a program that the user has indicated a desire to

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play back with the remote media server, wherein the charge is based on the length of the program.

15

64. The system defined in claim 1 wherein:  
the interactive television program guide is further configured to generate a record request when a user indicates a desire to cache a program with the remote media server;

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the remote media server is further configured to cache the program in response to the record request generated by the interactive television program guide when the user indicated a desire to cache a program;

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the system further comprises a billing system configured to charge a user for programs cached in real-time by the remote media server for the user; and

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the remote media server is further configured to generate billing information used by the billing system when billing the user, wherein:

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the billing information indicates a program that the remote media server cached for the user in response to the record request; and

40

the billing system charges the user based on a flat fee for recording a program with the remote media server.

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65. The system defined in claim 1 wherein:  
the interactive television program guide is further configured to generate a record request when a user indicates a desire to cache a program with the remote media server;

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the remote media server is further configured to cache the program in response to the record request generated by the interactive television program guide when the user indicated a desire to cache a program;

15

the system further comprises a billing system configured to charge a user for programs cached by the remote media server for the user; and

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the remote media server is further configured to generate billing information used by the billing system when billing the user, wherein:

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the billing information indicates a program that the remote media server cached for the user in response to the record request; and

the billing system charges the user based on a flat fee for recording programs.

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66. The system defined in claim 1 wherein:

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the interactive television program guide is further configured to generate a record request when a user indicates a desire to cache a program with the remote media server;

40

the remote media server is further configured to cache the program in response to the record request generated by the interactive television program guide when the user indicated a desire to cache a program;

45

the system further comprises a billing system configured to charge a user for programs cached by the remote media server for the user; and

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10                   the remote media server is further configured to generate billing information used by the billing system when billing the user, wherein:

15                   the billing information indicates a program that the remote media server cached for the user in response to the record request; and

20                   the billing system charges the user based on the length of the program.

25                 67. The system defined in claim 1 wherein:

20                   the interactive program guide television equipment comprises user television equipment;

25                   the interactive television program guide is further configured to generate a record request when a user indicates a desire to cache a program with the remote media server;

30                   the remote media server is further configured to cache the program in response to the record request generated by the interactive television program guide when the user indicated a desire to cache a program; and

35                   the interactive television program guide is further configured to indicate to the user on the user television equipment a charge for a program that the user has indicated a desire to cache with the remote media server, wherein the charge is based on a flat fee for recording a program with the remote media server.

40                 68. The system defined in claim 1 wherein:

45                   the interactive program guide television equipment comprises user television equipment;

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the interactive television program guide is further configured to generate a record request when a user indicates a desire to cache a program with the remote media server;

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the remote media server is further configured to cache the program in response to the record request generated by the interactive television program guide when the user indicated a desire to cache a program; and

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the interactive television program guide is further configured to indicate to the user a charge for a program that the user has indicated a desire to cache with the remote media server, wherein the charge is based on a flat fee for recording programs.

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69. The system defined in claim 1 wherein:

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the interactive program guide television equipment comprises user television equipment;

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the interactive television program guide is further configured to generate a record request when a user indicates a desire to cache a program with the remote media server;

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the remote media server is further configured to cache the program in response to the record request generated by the interactive television program guide when the user indicated a desire to cache a program; and

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the interactive television program guide is further configured to indicate to the user a charge for a program that the user has indicated a desire to cache with the remote media server, wherein the charge is based on the length of the program.

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10           70. The system defined in claim 1 wherein:  
               the interactive program guide television  
               equipment comprises user television equipment; and  
               the interactive television program guide

15           is further configured to provide a user with an  
               opportunity to enter a parental control code when the  
               user indicates a desire to record a program with the  
               remote media server.

20           71. The system defined in claim 1 wherein:  
               the interactive program guide television  
               equipment comprises user television equipment; and  
               the interactive television program guide

25           is further configured to provide a user with an  
               opportunity to enter a parental control code when the  
               user indicates a desire to play back a program with the  
               remote media server.

30           72. The system defined in claim 1 wherein:  
               the interactive television program guide  
               is further configured to provide a user with an  
               opportunity to set an audio format in which programs  
               are recorded with the remote media server; and

35           40           the remote media server is further  
               configured to record programs in the audio format.

45           73. The system defined in claim 1 wherein:  
               the interactive television program guide  
               is further configured to provide a user with an  
               opportunity to set a video format in which programs are  
               recorded with the remote media server; and

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the remote media server is further configured to record programs in the video format.

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74. The system defined in claim 1 wherein:  
the interactive television program guide is further configured to provide a user with an opportunity to set a language in which program audio on a digital audio track is recorded with the remote media server; and

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the remote media server is further configured to record program audio in the language.

25

75. The system defined in claim 1 wherein:  
the remote media server is further configured to determine whether a predetermined number of users have indicated a desire to record a program with the remote media server and to play back the program according to a schedule if less than the predetermined number of users indicated a desire to record the program with the remote media server; and

30

the distribution equipment is further configured to distribute program played back by the remote media server according to the schedule to users who indicated a desire to record the program with the remote media server.

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76. The system defined in claim 1 wherein:  
the remote media server is further

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configured to play back programs according to a schedule; and

the distribution equipment is further configured to distribute programs played back by the

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remote media server according to the schedule to users who indicated a desire to record the programs with the remote media server.

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77. The system defined in claim 1 wherein:  
the remote media server is further  
configured to automatically cache current programs that  
are being viewed by users; and

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the interactive television program guide  
is further configured to generate a playback request  
for a cached program when a user indicates a desire to  
view at least a portion of the cached program; and

25

the remote media server is further  
configured to play back at least a portion of a cached  
program in response to a playback request for the  
cached program generated by the interactive television  
program guide.

30

78. The system defined in claim 1 wherein  
the remote media server is further  
configured to automatically cache current programs that  
are being viewed by a subset of the users;

35

the interactive television program guide  
is further configured to generate a playback request  
for a cached program when a user of the subset of users  
indicates a desire to view at least a portion of the  
cached program; and

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the remote media server is further  
configured to play back at least a portion of a cached  
program in response to a playback request for the  
cached program generated by the interactive television  
program guide.

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10            79. An interactive television program guide system in which television programs are recorded and retrieved on-demand for a number of users, the system comprising:

15                a remote media server configured to store and retrieve programs on-demand for each user; distribution equipment configured to distribute programs to each user that are retrieved on-demand by the remote media server for each user; and  
20                interactive program guide television equipment on which an interactive television program guide is implemented and wherein the interactive television program guide is configured to:

25                generate a record request when a user indicates a desire to record a program on-demand with the remote media server; and

30                generate a retrieval request when a user indicates a desire to play back a program on-demand with the remote media server, and wherein the remote media server is further configured to:

35                record a program in response to the record request generated by the interactive television program guide; and

40                retrieve a program in response to the retrieval request generated by the interactive television program guide.

45            80. The system defined in claim 79 wherein the distribution equipment is configured to distribute programs to each user as at least on file.

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81. The system defined in claim 79 wherein:  
the distribution equipment is configured to distribute  
programs to each user in digital data streams.

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82. The system defined in claim 79 wherein:  
the interactive program guide television  
equipment further comprises user television equipment;  
and

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the interactive television program guide  
is further configured to play back a program on the  
user television equipment that was retrieved by the  
remote media server.

25

83. The system defined in claim 79 wherein:  
the interactive program guide television  
equipment comprises user television equipment,

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the remote media server is further  
configured to store and retrieve on-demand program  
guide data associated with the programs stored by the  
remote media server; and

35

the interactive television program guide  
is further configured to present program guide data on  
the user television equipment to the users as if an  
associated program were being originally aired.

40

84. A method for use in an interactive  
television program guide system in which television  
programs are recorded and played back on-demand by a  
remote media server for a number of users having user  
television equipment, the method comprising the steps  
of:

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10 generating a record request when a user indicates a desire to record a program on-demand with the remote media server; and

15 generating a playback request when a user indicates a desire to play back a program on-demand with the remote media server;

20 recording a program in response to the record request with the remote media server;

25 playing back a program with the remote media server in response to the playback request; and

distributing programs to the user television equipment of the user who indicated a desire to play back the program recorded with the remote media server.

30 85. The method defined in claim 84 further comprising the step of:

35 displaying a directory of program listings for programs recorded with the remote media server when a user indicates a desire to view a directory of program listings for programs recorded with the remote media server.

40 86. The method defined in claim 84 further comprising the step of:

45 displaying a directory of program listings sorted by title for programs recorded with the remote media server in response to a user indicating a desire to view a directory of program listings sorted by title for programs recorded with the remote media server.

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87. The method defined in claim 84 further comprising the step of:

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displaying a directory of program listings sorted by theme for programs recorded with the remote media server when a user indicates a desire to view a directory of program listings sorted by theme for programs recorded with the remote media server.

20

88. The method defined in claim 84 further comprising the step of:

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overlays a directory of program listings for programs recorded with the remote media server over a program that a user is watching when a user indicates a desire to view a directory of program listings for programs recorded with the remote media server.

30

89. The method defined in claim 84 further comprising the steps of:

35

generating a retrieval request when a user indicates a desire to play back a program that is stored with the remote media server;

40

retrieving a program from the remote media server and providing it to the user television equipment in response to the retrieval request; and storing the retrieved program on storage for playback.

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90. The method defined in claim 84 further comprising the step of:

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displaying information about a program recorded with the remote media server when a user

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indicates a desire to view information about the program recorded with the remote media server.

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91. The method defined in claim 84 further comprising the steps of:

generating a fast-forward request when a user indicates a desire to fast-forward a program that is being played back by the remote media server in response to a record request; and

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fast-forwarding the program that was recorded with the remote media server in response to the fast-forward request.

25

92. The method defined in claim 84 further comprising the steps of:

generating a rewind request when a user indicates a desire to rewind a program that is being played back by the remote media server in response to a record request; and

35

rewinding the program that was recorded with the remote media server in response to the rewind request.

40

93. The method defined in claim 84 further comprising the steps of:

generating a stop request when a user indicates a desire to stop a program that is being played back by the remote media server in response to a record request; and

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stopping the program that was recorded with the remote media server in response to the stop request.

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94. The method defined in claim 84 further comprising the steps of:

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generating a pause request when a user indicates a desire to pause a program that is being played back by the remote media server in response to a record request; and

20

pausing the program that was recorded with the remote media server in response to the pause request.

25

95. The method defined in claim 84 further comprising the steps of:

generating a record request when a user indicates a desire to cache a program with the remote media server; and

30

caching the program with the remote media server in response to the record request generated when the user indicated a desire to cache the program.

35

96. The method defined in claim 84 further comprising the step of:

automatically caching all current programs with the remote media server;

40

generating a playback request for a cached program when a user indicates a desire to view at least a portion of the cached program; and

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playing back at least a portion of the cached program with the remote media server in response to the playback request for the cached program.

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97. The method defined in claim 84 further comprising the steps of:

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generating a delete request when a user indicates a desire to delete a program that was recorded with the remote media server in response to a record request; and

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deleting the program with the remote media server in response to the delete request.

25

98. The method defined in claim 84 further comprising the step of:

automatically deleting programs with the remote media server.

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99. The method defined in claim 84 further comprising the steps of:

providing a user with an opportunity to define a super-program sequence;

35

generating at least one playback request according to the super-program sequence; and

playing back at least a portion of a program with the remote media server according to the super-program sequence in response to the at least one playback request.

40

100. The method defined in claim 84 wherein:

the step of distributing programs to the user television of a user comprises distributing the program as at least one file; and

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storing the files on storage in the user television equipment for playback on the user television equipment.

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10           101. The method defined in claim 84 wherein  
the user television equipment is included in  
interactive program guide television equipment, and the  
method further comprises the steps of:

15           storing program guide data associated  
with the programs stored by the remote media server for  
an interactive television program guide implemented on  
the interactive program guide television equipment with  
the remote media server; and

20           presenting the program guide data on the  
user television equipment with the interactive  
television program guide to a user as if an associated  
program were being originally aired.

25           25       102. The method defined in claim 84 further  
comprising the steps of:

30           30       consolidating multiple record requests  
for a program into a single job; and

              wherein the step of recording comprises  
recording a single copy of a program for multiple users  
according to the job.

35           35       103. The method defined in claim 84 further  
comprising the steps of:

40           40       determining whether a predetermined  
number of users have indicated a desire to record a  
program; and

45           45       recording the program with the remote  
media server when at least the predetermined number of  
users have indicated a desire to record the program.

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104. The method defined in claim 84 further comprising the steps of:

10 determining whether a predetermined number of users have indicated a desire to record a program; and

15 recording the program on physical media that is sent to users who requested the program when less than the predetermined number of users indicated a desire to record the program.

20

105. The method defined in claim 84 further comprising the steps of:

25 generating a record request when a user indicates a desire to record a television program on-demand with a local media server; and

30 generating a playback request when a user indicates a desire to play back a television program on-demand with the local media server; and

recording a program in response to the record request; and

35

playing back a program in response to the playback request.

106. The method defined in claim 105 further comprising the step of:

40 displaying a directory of program listings for programs recorded with the local media server when a user indicates a desire to view a directory of program listings for programs recorded with the local media server.

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107. The method defined in claim 105 further comprising the step of:

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displaying a directory of program listings sorted by title for programs recorded with the local media server in response to a user indicating a desire to view a directory of program listings sorted by title for programs recorded with the local media server.

20

108. The method defined in claim 105 further comprising the step of:

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displaying a directory of program listings sorted by theme for programs recorded with the local media server when a user indicates a desire to view a directory of program listings sorted by theme for programs recorded with the local media server.

30

109. The method defined in claim 105 further comprising the step of:

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overlaid a directory of program listings for programs recorded with the local media server over a program that a user is watching when a user indicates a desire to view a directory of program listings for programs recorded with the local media server.

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110. The method defined in claim 105 further comprising the steps of:

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generating a retrieval request when a user indicates a desire to play back a program that is stored on the local media server;

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retrieving a program from the local media server and providing it to the user television equipment in response to the retrieval request; and storing the retrieved program on storage for playback.

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111. The method defined in claim 105 further comprising the step of:

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displaying information about a program recorded with the local media server when a user indicates a desire to view information about the program recorded with the local media server.

25

112. The method defined in claim 105 further comprising the steps of:

30

generating a fast-forward request when a user indicates a desire to fast-forward a program that is being played back by the local media server in response to a record request; and

35

fast-forwarding the program that was recorded with the local media server in response to the fast-forward request.

40

113. The method defined in claim 105 further comprising the steps of:

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generating a rewind request when a user indicates a desire to rewind a program that is being played back by the local media server in response to a record request; and

rewinding the program that was recorded with the local media server in response to the rewind request.

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114. The method defined in claim 105 further comprising the steps of:

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generating a stop request when a user indicates a desire to stop a program that is being played back by the local media server in response to a record request; and

20

stopping the program that was recorded with the local media server in response to the stop request.

25

115. The method defined in claim 105 further comprising the steps of:

generating a pause request when a user indicates a desire to pause a program that is being played back by the local media server in response to a record request; and

30

pausing the program that was recorded with the local media server in response to the pause request.

35

116. The method defined in claim 105 further comprising the steps of:

generating a record request when a user indicates a desire to cache a program on the local media server; and

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caching the program with the local media server in response to the record request generated when the user indicated a desire to cache the program.

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117. The method defined in claim 105 further comprising the step of:

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automatically caching all current  
programs with the local media server;  
generating a playback request for a  
cached program when a user indicates a desire to view  
at least a portion of the cached program; and  
15 playing back at least a portion of the  
cached program with the local media server in response  
to the playback request for the cached program.

20

118. The method defined in claim 105 further  
comprising the steps of:

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generating a playback request for a  
program indicating a first user when a second user  
indicates a desire to record the program on the local  
media server for the first user; and

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recording the program for the first user  
with the local media server in response to the playback  
request indicating the first user.

35

119. The method defined in claim 105 further  
comprising the steps of:

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generating a delete request when a user  
indicates a desire to delete a program that was  
recorded with the local media server in response to a  
record request; and

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deleting the program with the local  
media server in response to the delete request.

120. The method defined in claim 105 further  
comprising the step of:

automatically deleting programs with the  
local media server.

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10 121. The method defined in claim 105 wherein  
the user television equipment is included in  
interactive program guide television equipment, and the  
method further comprises the steps of:

15 storing program guide data associated  
with the programs stored by the local media server for  
an interactive television program guide implemented on  
the interactive program guide television equipment with  
the local media server; and

20 presenting the program guide data on the  
user television equipment with the interactive  
television program guide to a user as if an associated  
program were being originally aired.

25 122. The method defined in claim 105 further  
comprising the steps of:

30 providing a user with an opportunity to  
define a super-program sequence;

generating at least one playback request  
according to the super-program sequence; and

35 playing back at least a portion of a  
program with the local media server according to the  
super-program sequence in response to the playback  
request.

40 123. The method defined in claim 105 further  
comprising the steps of:

45 determining whether a predetermined  
number of users have indicated a desire to record a  
program; and

directing the local media server to  
record the program when less than the predetermined

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number of users have indicated a desire to record the program.

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124. The method defined in claim 105 further comprising the steps of:

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determining whether a predetermined number of users have indicated a desire to record a program; and

25

directing the interactive television program guide to record the program on storage in the user television equipment when less than the predetermined number of users have indicated a desire to record the program.

30

125. The method defined in claim 84 further comprising the steps of:

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providing a user with an opportunity to purchase a pay-per-view program;

generating a record request for the pay-per-view program; and

40

recording the pay-per-view program with the remote media server in response to the record request for the pay-per-view program.

45

126. The method defined in claim 84 further comprising the steps of:

providing a user with an opportunity to purchase a pay-per-view program package having at least one pay-per-view program;

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generating a record request for the pay-per-view program package that indicates each pay-per-view program; and

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recording at least one pay-per-view program with the remote media server in response to the record request for the pay-per-view program package.

15

127. The method defined in claim 84 further comprising the steps of:

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generating a record request for a program grouping having at least one program when a user indicates a desire to record the program grouping with the remote media server; and

recording at least one program with the remote media server in response to the record request for the program grouping.

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128. The method defined in claim 84 further comprising the step of indicating to the user that a program cannot be recorded because the program is copy protected.

35

129. The method defined in claim 84 further comprising the step of preventing a user from selecting a program for recording by the remote media server when the program is copy protected.

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130. The method defined in claim 84 further comprising the step of recording program associated data for a program in response to a record request for the program.

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131. The method defined in claim 130 wherein the program associated data comprises interactive content.

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132. The method defined in claim 84 further comprising the step of displaying on the user television equipment a directory of program listings for programs to be recorded by the remote media server when a user indicates a desire to view a directory of program listings for programs to be recorded by the remote media server.

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133. The method defined in claim 84 further comprising the step of displaying a program guide display screen having program listings for at least one program that is not recorded by the remote media server and program listings for at least one program that is recorded by the remote media server, when the user indicates a desire to view a program guide display screen having program listings.

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134. The method defined in claim 84 further comprising the step of displaying a program guide display screen having program listings for at least one program that is not recorded by the remote media server and program listings for at least one program that is to be recorded by the remote media server, when the user indicates a desire to view a program guide display screen having program listings.

45

135. The method defined in claim 84 further comprising the steps of:

generating billing information that identifies a program that the remote media server recorded for the user in response to the record request; and

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charging the user for the identified program based on a flat fee for recording a program on the remote media server.

15

136. The method defined in claim 84 further comprising the steps of:

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generating billing information that indicates a program that the remote media server recorded for the user in response to the record request; and

charging the user based on a flat fee for recording programs.

25

137. The method defined in claim 84 further comprising the steps of:

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generating billing information that indicates a program that the remote media server recorded for the user in response to the record request; and

charging the user based on the length of the program.

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138. The method defined in claim 84 further comprising the step of indicating to the user a charge for a program that the user has indicated a desire to record with the remote media server, wherein the charge is based on a flat fee for recording a program on the remote media server.

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139. The method defined in claim 84 further comprising the step of indicating to the user a charge for a program that the user has indicated a desire to

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record with the remote media server, wherein the charge  
is based on a flat fee for recording programs.

15

140. The method defined in claim 84 further  
comprising the step of indicating to the user a charge  
for a program that the user has indicated a desire to  
record with the remote media server, wherein the charge  
is based on the length of the program.

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141. The method defined in claim 84 further  
comprising the steps of:

25

generating billing information that  
indicates a program that the remote media server played  
back for the user in response to the playback request;  
and

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charging the user based on a flat fee  
for playing back a program with the remote media  
server.

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142. The method defined in claim 84 further  
comprising the steps of:

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generating billing information that  
indicates a program that the remote media server played  
back for the user in response to the playback request;  
and

charging the user based on a flat fee  
for playing back programs.

45

143. The method defined in claim 84 further  
comprising the steps of:

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generating billing information that  
indicates a program that the remote media server played

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back for the user in response to the playback request;  
and

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charging the user based on the length of  
the program.

144. The method defined in claim 84 further  
comprising the step of indicating to the user a charge  
for a program that the user has indicated a desire to  
play back with the remote media server, wherein the  
charge is based on a flat fee for playing back a  
program with the remote media server.

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145. The method defined in claim 84 further  
comprising the step of indicating to the user a charge  
for a program that the user has indicated a desire to  
play back with the remote media server, wherein the  
charge is based on a flat fee for playing back programs  
with the remote media server.

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146. The method defined in claim 84 further  
comprising the step of indicating to the user a charge  
for a program that the user has indicated a desire to  
play back with the remote media server, wherein the  
charge is based on the length of the program.

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147. The method defined in claim 84 further  
comprising the steps of:

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generating a record request when a user  
indicates a desire to cache a program with the remote  
media server;

caching the program with the remote  
media server in response to the record request

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generated when the user indicated a desire to cache a program;

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generating billing information that indicates a program that the remote media server cached for the user in response to the record request; and charging the user based on a flat fee

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for recording a program on the remote media server.

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148. The method defined in claim 84 further comprising the steps of:

generating a record request when a user indicates a desire to cache a program with the remote media server;

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caching the program with the remote media server in response to the record request generated when the user indicated a desire to cache a program;

35

generating billing information that indicates a program that the remote media server cached for the user in response to the record request; and charging the user based on a flat fee

for recording programs.

40

149. The method defined in claim 84 further comprising the steps of:

generating a record request when a user indicates a desire to cache a program with the remote media server;

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caching the program with the remote media server in response to the record request generated when the user indicated a desire to cache a program;

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generating billing information that indicates a program that the remote media server cached for the user in response to the record request; and charging the user based on the length of the program.

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150. The method defined in claim 84 further comprising the steps of:

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generating a record request when a user indicates a desire to cache a program on the remote media server;

25

caching the program with the remote media server in response to the record request generated when the user indicated a desire to cache a program; and

30

indicating to the user on the user television equipment a charge for a program that the user has indicated a desire to cache with the remote media server, wherein the charge is based on a flat fee for recording a program on the remote media server.

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151. The method defined in claim 84 further comprising the steps of:

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generating a record request when a user indicates a desire to cache a program with the remote media server;

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caching the program with the remote media server in response to the record request generated when the user indicated a desire to cache a program; and

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indicating to the user a charge for a program that the user has indicated a desire to cache

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with the remote media server, wherein the charge is based on a flat fee for recording programs.

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152. The method defined in claim 84 further comprising the steps of:

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generating a record request when a user indicates a desire to cache a program with the remote media server;

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caching the program with the remote media server in response to the record request generated when the user indicated a desire to cache a program; and

25

indicating to the user a charge for a program that the user has indicated a desire to cache with the remote media server, wherein the charge is based on the length of the program.

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153. The method defined in claim 84 further comprising the step of providing a user with an opportunity to enter a parental control code when the user indicates a desire to record a program with the remote media server.

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154. The method defined in claim 84 further comprising the step of providing a user with an opportunity to enter a parental control code when the user indicates a desire to play back a program with the remote media server.

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155. The method defined in claim 84 further comprising the steps of:

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providing a user with an opportunity to set an audio format in which programs are recorded with the remote media server; and

recording programs with the remote media server in the audio format.

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156. The method defined in claim 84 further comprising the steps of:

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providing a user with an opportunity to set a video format in which programs are recorded with the remote media server; and

recording programs with the remote media server in the video format.

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157. The method defined in claim 84 further comprising the steps of:

providing a user with an opportunity to set a language in which program audio on a digital audio track is recorded with the remote media server; and

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recording program audio in the language with the remote media server.

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158. The method defined in claim 84 further comprising the steps of:

determining whether a predetermined number of users have indicated a desire to record a program with the remote media server;

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playing back the program with the remote media server according to a schedule if less than the predetermined number of users indicated a desire to record the program with the remote media server; and

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distributing the program played back by the remote media server according to the schedule to users who indicated a desire to record the program with the remote media server.

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159. The method defined in claim 84 further comprising the steps of:

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playing back programs with the remote media server according to a schedule; and

25

the distribution equipment is further configured to distribute programs played back by the remote media server according to the schedule to users who indicated a desire to record the programs with the remote media server.

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160. The method defined in claim 84 further comprising the steps of:

automatically caching current programs that are being viewed by users with the remote media server; and

35

generating a playback request for a cached program when a user indicates a desire to view at least a portion of the cached program; and

40

playing back at least a portion of a cached program with the remote media server in response to a playback request for the cached program.

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161. The method defined in claim 84 further comprising the steps of:

automatically caching current programs that are being viewed by a subset of the users with the remote media server;

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generating a playback request for a cached program when a user of the subset of users indicates a desire to view at least a portion of the cached program; and

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playing back at least a portion of a cached program with the remote media server in response to a playback request for the cached program.

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162. A method for use in an interactive television program guide system in which television programs are recorded and played back on-demand for a number of users, the method comprising the steps of:

25

generating a record request when a user indicates a desire to record a program on-demand with the remote media server; and

30

generate a retrieval request when a user indicates a desire to play back a program on-demand with the remote media server;

35

recording a program in response to the record request with the remote media server;

retrieving a program in response to the

retrieval request with the remote media server; and

distributing the retrieved program to the user that indicated a desire to retrieve the program.

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163. The method defined in claim 162 wherein the step of distributing the retrieved program comprises distributing the program to the user as at least on file.

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164. The method defined in claim 162 wherein the step of distributing the retrieved program comprises distributing the program to the user in digital data streams.

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165. The method defined in claim 162 further comprising the step of playing back a program on user television equipment when the user indicates a desire to play back the program.

20

166. The method defined in claim 162 further comprising the steps of:

25

storing program guide data associated with a program with the remote media server on-demand in response to a record request for the program; and

30

presenting the program guide data on the user television equipment as if the associated program were being originally aired.

35

167. An interactive television program guide system in which television programs are recorded and played back on-demand for a number of users, the system comprising:

40

means for generating a record request when a user indicates a desire to record a program on-demand;

45

means for generating a playback request when a user indicates a desire to play back a program on-demand;

50

means for remotely recording a program on-demand in response to the record request;

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means for remotely playing back a program in response to the playback request; and

means for distributing the played back program to a user who indicated a desire to play back the program.

15

168. The system defined in claim 167 further comprising means for displaying a directory of program listings for programs recorded with the means for remotely recording when a user indicates a desire to view a directory of program listings for programs recorded with the means for remotely recording.

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169. The system defined in claim 167 further comprising means for displaying a directory of program listings sorted by title for programs recorded with the means for remotely recording when a user indicates a desire to view a directory of program listings sorted by title for programs recorded with the means for remotely recording.

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170. The system defined in claim 167 further comprising means for displaying a directory of program listings sorted by theme for programs recorded with the means for remotely recording when a user indicates a desire to view a directory of program listings sorted by theme for programs recorded with the means for remotely recording.

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171. The system defined in claim 167 further comprising means for overlaying a directory of program listings for programs recorded with the means for

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remotely recording over a program that a user is watching when the user indicates a desire to view a directory of program listings for programs recorded with the means for remotely recording.

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172. The system defined in claim 167 wherein:  
the system further comprises means for generating a retrieval request when a user indicates a desire to play back a program that is recorded with the means for remotely recording;

20

the means for remotely playing back comprises means for retrieving a program in response to the retrieval request generated; and

25

the system further comprises means for storing the retrieved program.

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173. The system defined in claim 167 further comprising the means for displaying information about a program recorded with the means for remotely recording when a user indicates a desire to view information about the program.

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174. The system defined in claim 167 wherein:  
the system further comprises means for generating fast-forward request when a user indicates a desire to fast-forward a program that was recorded with the means for remotely recording; and

45

the means for remotely playing back is further configured to fast-forward the program in response to the fast-forward request.

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175. The system defined in claim 167 wherein:

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the system further comprises means for generating a rewind request when a user indicates a desire to rewind a program that is being played back by the means for remotely playing back; and

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the means for remotely playing back is further configured to rewind the program in response to the rewind request.

20

176. The system defined in claim 167 wherein:

the system further comprises means for generating a stop request when a user indicates a desire to stop a program that is being played back by the means for remotely playing back; and

25

the means for remotely playing back is further configured to stop the program in response to the stop request.

30

177. The system defined in claim 167 wherein:

the system further comprises means for generating a pause request when a user indicates a desire to pause a program that is being played back by the means for remotely playing back; and

35

the means for remotely playing back is further configured to pause the program in response to the pause request.

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178. The system defined in claim 167 wherein:

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the system further comprises means for generating a record request when a user indicates a desire to cache a program on the means for remotely recording; and

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the means for remotely recording further comprises means for caching the program a program in response to the record request generated when the user indicated a desire to cache a program.

15

179. The system defined in claim 167 wherein: the means for remotely recording further comprises means for automatically caching all current programs;

20

the system further comprises means for generating a playback request for a cached program when a user indicates a desire to view at least a portion of the program; and

25

the means for remotely playing back further comprises means for remotely playing back at least a portion of a cached program in response to the playback request for the cached program.

30

180. The system defined in claim 167 wherein: the system further comprises means for generating a delete request when a user indicates a desire to delete a program recorded with the means for remotely recording; and

40

the means for remotely recording further comprises means for deleting the program in response to the delete request.

45

181. The system defined in claim 167 wherein the means for remotely recording further comprises means for automatically deleting programs recorded with the means for remotely recording.

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10            182. The system defined in claim 167 wherein:  
              the system further comprises means for  
providing a user with an opportunity to define a super-  
program sequence;

15            the system further comprises means for  
generating at least one playback request according to  
the super-program sequence; and

20            the means for remotely playing back  
further comprises means for playing back at least a  
portion of a program in response to the playback  
request generated according to the super-program  
sequence.

25            183. The system defined in claim 167 wherein:  
              the means for distributing further  
comprises means for distributing the program as at  
least one file; and

30            the system further comprises means for  
storing the at least on file for playback.

35            184. The system defined in claim 167 wherein:  
              the means for remotely recording  
programs on-demand further comprises means for remotely  
recording on-demand program guide data associated with  
the programs stored by the remote media server;

40            the means for remotely playing back  
programs on-demand further comprises means for remotely  
playing back on-demand program guide data associated  
with the programs; and

45            the system further comprises means for  
presenting program guide data associated with a program

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to the user as if the associated program were being originally aired.

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185. The system defined in claim 167 further comprising:

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means for consolidating multiple record requests for a program into a single job; and

wherein the means for remotely recording comprises means for remotely recording a single copy of a program for multiple users according to the job.

25

186. The system defined in claim 167 further comprising means for determining whether enough users have indicated a desire to record a program and to record the program when enough users have indicated a desire to record the program.

30

187. The system defined in claim 167 further comprising means for determining whether a predetermined number of users have indicated a desire to record a program and to record the program on physical media that is sent to users that requested the program when less than a predetermined number of users have indicated a desire to record the program.

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188. The system defined in claim 167 further comprising means for:

locally recording television programs in response to the record requests; and

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locally playing back television programs in response to the playback requests.

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189. The system defined in claim 188 further comprising means for displaying a directory of program listings for programs recorded with the means for locally recording when a user indicates a desire to view a directory of program listings for programs recorded with the means for locally recording.

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190. The system defined in claim 188 further comprising means for displaying a directory of program listings sorted by title for programs recorded with the means for locally recording when a user indicates a desire to view a directory of program listings sorted by title for programs recorded with the means for locally recording.

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191. The system defined in claim 188 further comprising means for displaying a directory of program listings sorted by theme for programs recorded with the means for locally recording when a user indicates a desire to view a directory of program listings sorted by theme for programs recorded with the means for locally recording.

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192. The system defined in claim 188 further comprising means for overlaying a directory of program listings for programs recorded with the means for locally recording over a program that a user is watching when the user indicates a desire to view a directory of program listings for programs recorded with the means for locally recording.

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193. The system defined in claim 188 wherein:

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the system further comprises means for generating a retrieval request when a user indicates a desire to play back a program that is recorded with the means for locally recording;

15

the means for locally playing back comprises means for retrieving a program in response to the retrieval request generated; and

20

the system further comprises means for storing the retrieved program.

25

194. The system defined in claim 188 further comprising the means for displaying information about a program recorded with the means for locally recording when a user indicates a desire to view information about the program.

30

195. The system defined in claim 188 wherein:  
the system further comprises means for generating fast-forward request when a user indicates a desire to fast-forward a program that was recorded with the means for locally recording; and

35

the means for locally playing back is further configured to fast-forward the program in response to the fast-forward request.

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196. The system defined in claim 188 wherein:  
the system further comprises means for generating a rewind request when a user indicates a desire to rewind a program that was recorded with the means for locally recording; and

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10                   the means for locally playing back is  
                  further configured to rewind the program in response to  
                  the rewind request.

15                   197. The system defined in claim 188 wherein:  
                  the system further comprises means for  
                  generating a stop request when a user indicates a  
                  desire to stop a program that was recorded with the  
                  means for locally recording; and

20                   the means for locally playing back is  
                  further configured to stop the program in response to  
                  the stop request.

25                   198. The system defined in claim 188 wherein:  
                  the system further comprises means for  
                  generating a pause request when a user indicates a  
                  desire to pause a program that was recorded with the  
                  means for locally recording; and

30                   the means for locally playing back is  
                  further configured to pause the program in response to  
                  the pause request.

35                   199. The system defined in claim 188 wherein:  
                  the system further comprises means for  
                  generating a record request when a user indicates a  
                  desire to cache a program on the means for locally  
                  recording; and

40                   the means for locally recording further  
                  comprises means for caching the program in response to  
                  the record request generated when the user indicated a  
                  desire to cache the program.

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200. The system defined in claim 188 wherein:

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the means for locally recording further comprises means for automatically caching all current programs;

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the system further comprises means for generating a playback request for a cached program when a user indicates a desire to view at least a portion of the cached program; and

20

the means for locally playing back further comprises means for playing back at least a portion of the cached program in response to the playback request for the cached program.

25

201. The system defined in claim 188 wherein:

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the system further comprises means for generating a playback request for a program indicating a first user when a second user indicates a desire to record the program on the means for locally recording for the first user; and

35

the means for locally recording comprises means for recording the program for the first user in response to the playback request indicating the first user.

40

202. The system defined in claim 188 wherein:

45

the system further comprises means for generating a delete request when a user indicates a desire to delete a program recorded with the means for locally recording; and

the means for locally recording further comprises means for deleting the program in response to the delete request.

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203. The system defined in claim 188 wherein  
the means for locally recording further comprises means  
for automatically deleting programs recorded with the  
means for locally recording.

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204. The system defined in claim 188 wherein:  
the system further comprises means for  
providing a user with an opportunity to define a super-  
program sequence;

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the system further comprises means for  
generating at least one playback request according to  
the super-program sequence; and

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the means for locally playing back  
further comprises means for playing back at least a  
portion of a program in response to the playback  
request generated according to the super-program  
sequence.

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205. The system defined in claim 188 wherein:  
the means for locally recording programs  
on-demand further comprises means for locally recording  
on-demand program guide data associated with the  
programs stored by the locally media server;

35

the means for locally playing back  
programs on-demand further comprises means for locally  
playing back on-demand program guide data associated  
with the programs; and

40

the system further comprises means for  
presenting program guide data associated with a program  
to the user as if the associated program were being  
originally aired.

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206. The system defined in claim 188 further comprising:

means for determining whether a predetermined number of users have indicated a desire to record a program; and

means for directing the means for remotely recording the program when less than the predetermined number of users have indicated a desire to record the program.

20

207. The system defined in claim 188 further comprising:

means for determining whether a predetermined number of users have indicated a desire to record a program; and

means for recording the program when less than the predetermined number of users have indicated a desire to record the program.

35

208. The system defined in claim 167 further comprising:

means for providing a user with an opportunity to purchase a pay-per-view program;

means for generating a record request for the pay-per-view program; and wherein:

the means for remotely recording comprises means for recording the pay-per-view program in response to the record request for the pay-per-view program.

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209. The system defined in claim 167 further comprising:

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means for providing a user with an opportunity to purchase a pay-per-view program package having at least one pay-per-view program;

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means for generating a record request for the pay-per-view program package that indicates each pay-per-view program; and wherein:

20

the means for remotely recording comprises means for recording at least one pay-per-view program in response to the record request for the pay-per-view program package.

25

210. The system defined in claim 167 further comprising:

30

means generating a record request for a program grouping having at least one program when a user indicates a desire to record the program grouping with the means for remotely recording; and

35

the means for remotely recording comprises means for recording at least one program in response to the record request for the program grouping.

40

211. The system defined in claim 167 further comprising means for indicating to the user that a program cannot be recorded because the program is copy protected.

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212. The system defined in claim 167 further comprising means for preventing a user from selecting a program for recording when the program is copy protected.

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213. The system defined in claim 167 further comprising means for recording program associated data for a program in response to a record request for the program.

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214. The system defined in claim 213 wherein the program associated data comprises interactive content.

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215. The system defined in claim 167 further comprising means for displaying a directory of program listings for programs to be recorded with the means for remotely recording when a user indicates a desire to view a directory of program listings for programs to be recorded by the means for remotely recording.

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216. The system defined in claim 167 further comprising means for displaying a program guide display screen having program listings for at least one program that is not recorded with the means for remotely recording and program listings for at least one program that is recorded by the remote media server, when the user indicates a desire to view a program guide display screen having program listings.

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217. The system defined in claim 167 further comprising means for displaying a program guide display screen having program listings for at least one program that is not recorded with the means for remotely recording and program listings for at least one program that is to be recorded with the means for remotely

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recording, when the user indicates a desire to view a program guide display screen having program listings.

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218. The system defined in claim 167 further comprising:

means for generating billing information that identifies a program that the means for remotely recording recorded for the user in response to the record request; and

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means for charging the user for the identified program based on a flat fee for recording a program with the means for remotely recording.

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219. The system defined in claim 167 further comprising:

means for generating billing information that indicates a program that the means for remotely recording recorded for the user in response to the record request; and

means for charging the user based on a flat fee for recording programs.

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220. The system defined in claim 167 further comprising:

means for generating billing information that indicates a program that the means for remotely recording recorded for the user in response to the record request; and

means for charging the user based on the length of the program.

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221. The system defined in claim 167 further comprising means for indicating to the user a charge for a program that the user has indicated a desire to record with the means for remotely recording wherein the charge is based on a flat fee for recording a program with the means for remotely recording.

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222. The system defined in claim 167 further comprising means for indicating to the user a charge for a program that the user has indicated a desire to record with the means for remotely recording, wherein the charge is based on a flat fee for recording programs.

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223. The system defined in claim 167 further comprising means for indicating to the user a charge for a program that the user has indicated a desire to record with the means for remotely recording, wherein the charge is based on the length of the program.

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224. The system defined in claim 167 further comprising:

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means for generating billing information that indicates a program that the means for remotely playing back played back for the user in response to the playback request; and

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means for charging the user based on a flat fee for playing back a program on the remote media server.

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225. The system defined in claim 167 further comprising:

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means for generating billing information that indicates a program that the means for remotely playing back played back for the user in response to the playback request; and

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means for charging the user based on a flat fee for playing back programs.

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226. The system defined in claim 167 further comprising:

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means for generating billing information that indicates a program that the means for remotely playing back played back for the user in response to the playback request; and

means for charging the user based on the length of the program.

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227. The system defined in claim 167 further comprising means for indicating to the user a charge for a program that the user has indicated a desire to play back with the means for remotely playing back, wherein the charge is based on a flat fee for playing back a program with the means for remotely playing back.

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228. The system defined in claim 167 further comprising means for indicating to the user a charge for a program that the user has indicated a desire to play back with the means for remotely playing back, wherein the charge is based on a flat fee for playing back programs with the means for remotely playing back.

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229. The system defined in claim 167 further comprising means for indicating to the user a charge for a program that the user has indicated a desire to play back with the means for remotely playing back, wherein the charge is based on the length of the program.

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230. The system defined in claim 167 further comprising:

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means for generating a record request when a user indicates a desire to cache a program with the means for remotely recording;

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means for caching the program in response to the record request generated when the user indicated a desire to cache a program;

means for generating billing information that indicates a program that the means for caching cached for the user in response to the record request; and

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means for charging the user based on a flat fee for caching a program on the remote media server.

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231. The system defined in claim 167 further comprising:

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means for generating a record request when a user indicates a desire to cache a program;

means for caching the program in response to the record request generated when the user indicated a desire to cache a program;

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means for generating billing information  
that indicates a program that the means for caching  
cached in response to the record request; and  
means for charging the user based on a  
flat fee for caching programs.

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232. The system defined in claim 167 further  
comprising:

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means for generating a record request  
when a user indicates a desire to cache a program;  
means for caching the program in  
response to the record request generated when the user  
indicated a desire to cache a program;

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means for generating billing information  
that indicates a program that the means for caching  
cached for the user in response to the record request;  
and

30

means for charging the user based on the  
length of the program.

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233. The system defined in claim 167 further  
comprising:

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means for generating a record request  
when a user indicates a desire to cache a program;  
means for caching the program in  
response to the record request generated when the user  
indicated a desire to cache a program; and

45

means for indicating to the user a  
charge for a program that the user has indicated a  
desire to cache, wherein the charge is based on a flat  
fee for caching a program with the means for caching.

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234. The system defined in claim 167 further comprising:

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means for generating a record request when a user indicates a desire to cache a program; means for caching the program in response to the record request generated when the user indicated a desire to cache a program; and

20

means for indicating to the user a charge for a program that the user has indicated a desire to cache, wherein the charge is based on a flat fee for recording programs.

25

235. The system defined in claim 167 further comprising:

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means for generating a record request when a user indicates a desire to cache a program; means for caching the program in response to the record request generated when the user indicated a desire to cache a program; and

35

means for indicating to the user a charge for a program that the user has indicated a desire to cache, wherein the charge is based on the length of the program.

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236. The system defined in claim 167 further comprising means for providing a user with an opportunity to enter a parental control code when the user indicates a desire to record a program with the means for remotely recording.

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237. The system defined in claim 167 further comprising means for providing a user with an

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10 opportunity to enter a parental control code when the means for remotely recording.

15 238. The system defined in claim 167 further comprising:

means for providing a user with an opportunity to set an audio format in which programs are recorded; and wherein:

20 the means for remotely recording comprising means for remotely recording in the audio format.

25 239. The system defined in claim 167 further comprising:

means for providing a user with an opportunity to set a video format in which programs are recorded; and wherein:

30 the means for remotely recording comprises means for remotely recording programs with the remote media server in the video format.

35 240. The system defined in claim 167 further comprising:

means for providing a user with an opportunity to set a language in which program audio on a digital audio track is recorded; and wherein:

40 the means for remotely recording comprises means for recording program audio in the language.

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241. The system defined in claim 167 wherein:

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the system further comprises means for determining whether a predetermined number of users have indicated a desire to record a program with the means for remotely recording;

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the means for remotely playing back comprises means for playing back the program according to a schedule if less than the predetermined number of users indicated a desire to record the program; and

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the means for distributing comprises means for distributing the program played back by the means for playing back according to the schedule to users who indicated a desire to record the program.

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242. The system defined in claim 167 wherein:

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the means for remotely playing back comprises means for playing back programs according to a schedule; and

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the means for distributing comprises means for distributing programs played back according to the schedule to users who indicated a desire to record the programs with the means for remotely recording.

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243. The system defined in claim 167 further comprising:

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means for automatically caching current programs that are being viewed by users;

means for generating a playback request for a cached program when a user indicates a desire to view at least a portion of the cached program; and

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means for playing back at least a portion of a cached program in response to a playback request for the cached program.

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244. The system defined in claim 167 further comprising:

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means for automatically caching current programs that are being viewed by a subset of the users;

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means for generating a playback request for a cached program when a user of the subset of users indicates a desire to view at least a portion of the cached program; and

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means for playing back at least a portion of a cached program in response to a playback request for the cached program.

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245. An interactive television program guide system in which television programs are recorded and played back on-demand for a number of users, the system comprising:

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means for generating a retrieval request when a user indicates a desire to record a program on-demand; and

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means for generating a playback request when a user indicates a desire to play back a program on-demand;

means for recording television programs in response to the record requests generated; and

means for retrieving television programs in response to the retrieval requests; and

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means for distributing programs that are played back on-demand by the means for remotely playing back to each user.

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246. The system defined in claim 245 wherein the means for distributing comprises means for distributing programs to each user as at least one file.

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247. The system defined in claim 245 wherein the means for distributing comprises means for distributing programs to each user in digital data streams.

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248. The system defined in claim 245 further comprising:

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means for playing back a program on a user's user television equipment when a user indicates a desire to play back the program.

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249. The system defined in claim 245 wherein: the means for remotely recording further comprises means for remotely recording on-demand program guide data associated with the program stored by the means for remotely recording;

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the means for retrieving further comprises means for retrieving on-demand program guide data associated with the programs; and

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the system further comprises means for presenting program guide data associated with a program to the user as if the associated program were being originally aired.

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250. An interactive television program guide system in which television programs are recorded and played back on-demand for a number of users, the system comprising:

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a remote media server configured to store and play back programs on-demand for each user; an Internet service system configured to:

20

provide a record request to the remote media server when a user indicates a desire to record a program on-demand with the remote media server; and

25

provide a playback request to the remote media server when a user indicates a desire to play back a program on-demand with the remote media server, and wherein the remote media server is further configured to:

30

record a program in response to the record request provided by the Internet service system; and

35

play back a program in response to the playback request provided by the Internet service system.

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251. The system defined in claim 250 wherein the personal computer is further configured to display a directory of program listings for programs recorded with the remote media server when a user indicates a desire to view a directory of program listings for programs recorded with the remote media server.

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252. The system defined in claim 250 wherein the personal computer is further configured to display a directory of program listings sorted by title for programs recorded with the remote media server when a user indicates a desire to view a directory of program listings sorted by title for programs recorded with the remote media server.

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253. The system defined in claim 250 wherein the personal computer is further configured to display a directory of program listings sorted by theme for programs recorded with the remote media server when a user indicates a desire to view a directory of program listings sorted by theme for programs recorded with the remote media server.

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254. The system defined in claim 250 wherein the personal computer is further configured to display a directory of program listings for programs recorded with the remote media server with a program that a user is watching on the personal computer when a user indicates a desire to view a directory of program listings for programs recorded with the remote media server.

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255. The system defined in claim 250 wherein:  
the Internet service system is further configured to provide a retrieval request to the remote media server when a user indicates a desire to play back a program recorded with the remote media server;  
the remote media server is further configured to retrieve a program and provide it to the

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Internet service system in response to the retrieval request provided by the Internet service system; and  
the personal computer is further configured to store the retrieved program on storage for playback.

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256. The system defined in claim 250 wherein the personal computer is further configured to display information about a program recorded with the remote media server when a user indicates a desire to view information about the program recorded with the remote media server.

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257. The system defined in claim 250 wherein:  
the Internet service system is further configured to provide a fast-forward request to the remote media server when a user indicates a desire to fast-forward a program that is being played back by the remote media server; and  
the remote media server is further configured to fast-forward the program in response to the fast-forward request provided by the Internet service system.

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258. The system defined in claim 250 wherein:  
the Internet service system is further configured to provide a rewind request to the remote media server when a user indicates a desire to rewind a program that is being played back by the remote media server; and

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the remote media server is further configured to rewind the program in response to the rewind request provided by the Internet service system.

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259. The system defined in claim 250 wherein:  
the Internet service system is further configured to provide a stop request to the remote media server when a user indicates a desire to stop a program that is being played back by the remote media server; and

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the remote media server is further configured to stop the program in response to the stop request provided by the Internet service system.

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260. The system defined in claim 250 wherein:  
the Internet service system is further configured to provide a pause request to the remote media server when a user indicates a desire to pause a program that is being played back by the remote media server; and

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the remote media server is further configured to pause the program in response to the pause request provided by the Internet service system.

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261. The system defined in claim 250 wherein:  
the Internet service system is further configured to provide a record request to the remote media server when a user indicates a desire to cache a program with the remote media server; and

the remote media server is further configured to cache the program in response to the

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record request provided by the Internet service system when the user indicated a desire to cache a program.

15

262. The system defined in claim 250 wherein:  
the remote media server is further  
configured to automatically cache all current programs;  
the Internet service system is further  
configured to provide a playback request to the remote  
media server for a cached program when a user indicates  
a desire to view at least a portion of the cached  
program; and

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the remote media server is further  
configured to play back at least a portion of a cached  
program in response to a playback request for the  
cached program provided by the Internet service system.

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263. The system defined in claim 250 wherein:  
the Internet service system is further  
configured to provide a delete request to the remote  
media server when a user indicates a desire to delete a  
program recorded with the remote media server; and  
the remote media server is further  
configured to delete the program in response to the  
delete request provided by the Internet service system.

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264. The system defined in claim 250 wherein  
the remote media server is further configured to  
automatically delete programs recorded with the remote  
media server.

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265. The system defined in claim 250 wherein:

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10                   the personal computer is further  
configured to provide a user with an opportunity to  
define a super-program sequence;

15                   the Internet service system is further  
configured to provide at least one playback request to  
the remote media server according to the super-program  
sequence; and

20                   the remote media server is further  
configured to play back at least a portion of a program  
in response to the at least one playback request  
provided by the Internet service system according to  
the super-program sequence.

25                   266. The system defined in claim 250 wherein:  
                      the Internet service system is further  
configured to transmit programs recorded with the  
remote media server to the personal computer as files;  
and

30                   the personal computer is further  
configured to store the files on the storage for  
playback.

35                   267. The system defined in claim 250 wherein:  
                      the remote media server is further  
configured to store and play back on-demand program  
guide data associated with the programs stored by the  
remote media server; and

40                   the personal computer is further  
configured to present program guide data to a user as  
if an associated program were being originally aired.

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268. The system defined in claim 250 wherein  
the remote media server:

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comprises a consolidator configured to  
consolidate multiple record requests for a program into  
a single job; and

is further configured to record a single  
copy of a program for multiple users according to the  
job.

20

269. The system defined in claim 250 wherein  
the remote media server is further configured to  
determine whether a predefined number of users have  
indicated a desire to record a program and to record  
the program when at least the predefined number of  
users have indicated a desire to record the program.

25

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270. The system defined in claim 250 wherein  
the remote media server is further configured to  
determine whether a predetermined number of users have  
indicated a desire to record a program and to record  
the program on physical media that is sent to users who  
requested the program when less than the predetermined  
number of users have indicated a desire to record the  
program.

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271. The system defined in claim 250 wherein:  
the system further comprises a local  
media server configured to store and play back programs  
on-demand for at least one user;  
the Internet service system is further  
configured to:

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provide a record request to the local media server when a user indicates a desire to record a program on-demand with the local media server; and

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provide a playback request to the local media server when a user indicates a desire to play back a program on-demand with the local media server, and wherein the local media server is further configured to:

20

record a program in response to the record request provided by the Internet service system; and

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play back a program in response to the playback request provided by the Internet service system.

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272. The system defined in claim 271 wherein the personal computer is further configured to display a directory of program listings for programs recorded with the local media server when a user indicates a desire to view a directory of program listings for programs recorded with the local media server.

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273. The system defined in claim 271 wherein the personal computer is further configured to display a directory of program listings sorted by title for programs recorded with the local media server when a user indicates a desire to view a directory of program listings sorted by title for programs recorded with the local media server.

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10                   274. The system defined in claim 271 wherein  
the personal computer is further configured to display  
a directory of program listings sorted by theme for  
programs recorded with the local media server when a  
user indicating a desire to view a directory of program  
listings sorted by theme for programs recorded with the  
local media server.

20                   275. The system defined in claim 271 wherein  
the personal computer is further configured to display  
a directory of program listings for programs recorded  
with the local media server with a program that a user  
is watching when a user indicates a desire to view a  
directory of program listings for programs recorded  
with the local media server.

30                   276. The system defined in claim 271 wherein:  
the Internet service system is further  
configured to provide a retrieval request to the local  
media server when a user indicates a desire to play  
back a program recorded with the local media server;  
35                   the local media server retrieves a  
program and provides it to the personal computer in  
response to the retrieval request provided by the  
Internet service system; and  
40                   the personal computer is further  
configured to store the retrieved program on storage  
for playback.

45                   277. The system defined in claim 271 wherein  
the personal computer is further configured to display  
information about a program recorded with the local

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media server when a user indicates a desire to view information about the program recorded with the local media server.

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278. The system defined in claim 271 wherein:  
the Internet service system is further configured to provide a fast-forward request to the local media server when a user indicates a desire to fast-forward a program that is being played back by the local media server; and

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the local media server is further configured to fast-forward the program in response to the fast-forward request provided by the Internet service system.

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279. The system defined in claim 271 wherein:  
the Internet service system is further configured to provide a rewind request to the local media server when a user indicates a desire to rewind a program that is being played back by the local media server; and

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the local media server is further configured to rewind the program in response to the rewind request provided by the Internet service system.

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280. The system defined in claim 271 wherein:  
the Internet service system is further configured to provide a stop request to the local media server when a user indicates a desire to stop a program that is being played back by the local media server;  
and

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the local media server is further configured to stop the program in response to the stop request provided by the Internet service system.

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281. The system defined in claim 271 wherein:  
the Internet service system is further configured to provide a pause request to the local media server when a user indicates a desire to pause a program that is being played back by the local media server; and

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the local media server is further configured to pause the program in response to the pause request provided by the Internet service system.

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282. The system defined in claim 271 wherein:  
the Internet service system is further configured to provide a record request to the local media server when a user indicates a desire to cache a program on the local media server; and

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the local media server is further configured to cache the program in response to the record request provided by the Internet service system when the user indicated a desire to cache a program.

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283. The system defined in claim 271 wherein:  
the local media server is further configured to automatically cache all current programs;  
the Internet service system is further configured to provide a playback request to the local media server for a cached program when a user indicates a desire to view at least a portion of the cached program; and

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the local media server is further configured to play back at least a portion of a cached program in response to the playback request for the cached program provided by the Internet service system.

15

284. The system defined in claim 271 wherein:  
the Internet service system is further configured to provide a delete request to the local media server when a user indicates a desire to delete a program recorded with the local media server; and

20

the local media server is further configured to delete the program in response to the delete request provided by the Internet service system.

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285. The system defined in claim 271 wherein  
the local media server is further configured to automatically delete programs recorded with the local media server.

30

286. The system defined in claim 271 wherein:

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the personal computer is further configured to provide a user with an opportunity to define a super-program sequence;

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the Internet service system is further configured to provide at least one playback request to the local media server according to the super-program sequence; and

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the local media server is further configured to play back at least a portion of a program in response to the playback request provided by the Internet service system according to the super-program sequence.

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10                 287. The system defined in claim 271 wherein:  
                       the local media server is further  
                       configured to store and play back on-demand program  
                       guide data associated with the programs stored by the  
                       local media server; and

15                 the personal computer is further  
                       configured to present program guide data to a user as  
                       if an associated program were being originally aired.

20                 288. The system defined in claim 271 wherein  
                       the remote media server is further configured to  
                       determine whether a predetermined number of users have  
                       indicated a desire to record a program and to direct  
                       the local media server to record the program when less  
                       than the predetermined number of users have indicated a  
                       desire to record the program.

25                 289. The system defined in claim 271 wherein  
                       the remote media server is further configured to  
                       determine whether a predetermined number of users have  
                       indicated a desire to record a program and to direct  
                       the personal computer to record the program when less  
                       than the predetermined number of users have indicated a  
                       desire to record the program.

30                 290. The system defined in claim 250 wherein:  
                       the personal computer is further  
                       configured to provide a user with an opportunity to  
                       purchase a pay-per-view program;  
                       the Internet service system is further  
                       configured to provide a record request to the remote  
                       media server for the pay-per-view program; and

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the remote media server is configured to record the pay-per-view program in response to the record request for the pay-per-view program.

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291. The system defined in claim 250 wherein:  
the personal computer is further configured to provide a user with an opportunity to purchase a pay-per-view program package having at least one pay-per-view program;

20

the Internet service system is further configured to provide a record request to the remote media server for the pay-per-view program package that indicates each pay-per-view program; and

25

the remote media server is configured to record the at least one pay-per-view program in response to the record request for the pay-per-view program package.

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292. The system defined in claim 250 wherein:  
the Internet service system is further configured to provide a record request to the remote media server for a program grouping having at least one program when a user indicates a desire to record the program grouping with the remote media server; and

40

the remote media server is configured to record the at least one program in response to the record request for the program grouping.

45

293. The system defined in claim 250 wherein the personal computer is further configured to indicate to the user that a program cannot be recorded because the program is copy protected.

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294. The system defined in claim 250 wherein the personal computer is further configured to prevent a user from selecting a program for recording by the remote media server when the program is copy protected.

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295. The system defined in claim 250 wherein the remote media server is further configured to record program associated data for a program in response to a record request for the program provided by the Internet service system.

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296. The system defined in claim 295 wherein the program associated data comprises interactive content.

30

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297. The system defined in claim 250 wherein the personal computer is further configured to display a directory of program listings for programs to be recorded with the remote media server when a user indicates a desire to view a directory of program listings for programs to be recorded with the remote media server.

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298. The system defined in claim 250 wherein the personal computer is further configured to display a program guide display screen having program listings for at least one program that is not recorded with the remote media server and program listings for at least one program that is recorded with the remote media server, when the user indicates a desire to view a program guide display screen having program listings.

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10                 299. The system defined in claim 250 wherein  
the personal computer is further configured to display  
a program guide display screen having program listings  
for at least one program that is not recorded with the  
remote media server and program listings for at least  
one program that is to be recorded with the remote  
media server, when the user indicates a desire to view  
a program guide display screen having program listings.

20                 300. The system defined in claim 250 wherein:  
                       the system further comprises a billing  
system configured to charge a user for programs  
recorded with the remote media server for the user; and  
                       the remote media server is further  
configured to provide billing information used by the  
billing system when billing the user, wherein:  
                       the billing information identifies  
30                 a program that the remote media server recorded for the  
user in response to the record request; and  
                       the billing system charges the user  
based on a flat fee for recording a program with the  
remote media server.

40                 301. The system defined in claim 250 wherein:  
                       the system further comprises a billing  
system configured to charge a user for programs  
recorded with the remote media server for the user; and  
                       the remote media server is further  
configured to provide billing information used by the  
billing system when billing the user, wherein:

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the billing information indicates a program that the remote media server recorded for the user in response to the record request; and

the billing system charges the user based on a flat fee for recording programs.

15

302. The system defined in claim 250 wherein:  
the system further comprises a billing system configured to charge a user for programs recorded with the remote media server for the user; and  
the remote media server is further configured to provide billing information used by the billing system when billing the user, wherein:

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the billing information indicates a program that the remote media server recorded for the user in response to the record request; and

30

the billing system charges the user based on the length of the program.

35

303. The system defined in claim 250 wherein the personal computer is further configured to indicate to the user a charge for a program that the user has indicated a desire to record with the remote media server, wherein the charge is based on a flat fee for recording a program with the remote media server.

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304. The system defined in claim 250 wherein the personal computer is further configured to indicate to the user a charge for a program that the user has indicated a desire to record with the remote media server, wherein the charge is based on a flat fee for recording programs.

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305. The system defined in claim 250 wherein  
the personal computer is further configured to indicate  
to the user a charge for a program that the user has  
indicated a desire to record with the remote media  
server, wherein the charge is based on the length of  
the program.

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306. The system defined in claim 250 wherein:  
the system further comprises a billing  
system configured to charge a user for programs played  
back by the remote media server for the user; and  
the remote media server is further  
configured to provide billing information used by the  
billing system when billing the user, wherein:

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the billing information indicates a  
program that the remote media server played back for  
the user in response to the playback request; and

30

the billing system charges the user  
based on a flat fee for playing back a program with the  
remote media server.

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307. The system defined in claim 250 wherein:  
the system further comprises a billing  
system configured to charge a user for programs played  
back by the remote media server for the user; and

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the remote media server is further  
configured to provide billing information used by the  
billing system when billing the user, wherein:

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the billing information indicates a  
program that the remote media server played back for  
the user in response to the playback request; and

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the billing system charges the user based on a flat fee for playing back programs.

15

308. The system defined in claim 250 wherein:  
the system further comprises a billing system configured to charge a user for programs played back by the remote media server for the user; and  
the remote media server is further configured to provide billing information used by the billing system when billing the user, wherein:

20

the billing information indicates a program that the remote media server played back for the user in response to the playback request; and  
the billing system charges the user based on the length of the program.

25

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309. The system defined in claim 250 wherein the personal computer is further configured to indicate to the user a charge for a program that the user has indicated a desire to play back with the remote media server, wherein the charge is based on a flat fee for playing back a program with the remote media server.

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310. The system defined in claim 250 wherein the personal computer is further configured to indicate to the user a charge for a program that the user has indicated a desire to play back with the remote media server, wherein the charge is based on a flat fee for playing back programs with the remote media server.

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311. The system defined in claim 250 wherein the personal computer is further configured to indicate

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to the user a charge for a program that the user has indicated a desire to play back with the remote media server, wherein the charge is based on the length of the program.

15

312. The system defined in claim 250 wherein: the Internet service system is further configured to provide a record request to the remote media server when a user indicates a desire to cache a program with the remote media server;

20

the remote media server is further configured to cache the program in response to the record request provided by the Internet service system when the user indicated a desire to cache a program;

25

the system further comprises a billing system configured to charge a user for programs cached in real-time by the remote media server for the user; and

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the remote media server is further configured to provide billing information used by the billing system when billing the user, wherein:

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the billing information indicates a program that the remote media server cached for the user in response to the record request; and

40

the billing system charges the user based on a flat fee for recording a program with the remote media server.

45

313. The system defined in claim 250 wherein: the Internet service system is further configured to provide a record request to the remote

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10 media server when a user indicates a desire to cache a program with the remote media server;

15 the remote media server is further configured to cache the program in response to the record request provided by the Internet service system when the user indicated a desire to cache a program;

20 the system further comprises a billing system configured to charge a user for programs cached by the remote media server for the user; and

25 the remote media server is further configured to provide billing information used by the billing system when billing the user, wherein:

30 the billing information indicates a program that the remote media server cached for the user in response to the record request; and

35 the billing system charges the user based on a flat fee for recording programs.

40 314. The system defined in claim 250 wherein:  
the Internet service system is further configured to provide a record request to the remote media server when a user indicates a desire to cache a program with the remote media server;

45 the remote media server is further configured to cache the program in response to the record request provided by the Internet service system when the user indicated a desire to cache a program;

50 the system further comprises a billing system configured to charge a user for programs cached by the remote media server for the user; and

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10                   the remote media server is further  
configured to provide billing information used by the  
billing system when billing the user, wherein:

15                   the billing information indicates a  
program that the remote media server cached for the  
user in response to the record request; and

15                   the billing system charges the user  
based on the length of the program.

20                   315. The system defined in claim 250 wherein:

25                   the Internet service system is further  
configured to provide a record request to the remote  
media server when a user indicates a desire to cache a  
program with the remote media server;

30                   the remote media server is further  
configured to cache the program in response to the  
record request provided by the Internet service system  
when the user indicated a desire to cache a program;  
and

35                   the personal computer is further  
configured to indicate to the user a charge for a  
program that the user has indicated a desire to cache  
with the remote media server, wherein the charge is  
based on a flat fee for recording a program with the  
remote media server.

40

316. The system defined in claim 250 wherein:

45                   the Internet service system is further  
configured to provide a record request to the remote  
media server when a user indicates a desire to cache a  
program with the remote media server;

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10                         the remote media server is further  
                               configured to cache the program in response to the  
                               record request provided by the Internet service system  
                               when the user indicated a desire to cache a program;  
                               and

15                         the personal computer is further  
                               configured to indicate to the user a charge for a  
                               program that the user has indicated a desire to cache  
                               with the remote media server, wherein the charge is  
                               based on a flat fee for recording programs.

20                         317. The system defined in claim 250 wherein:  
                               the Internet service system is further  
                               configured to provide a record request to the remote  
                               media server when a user indicates a desire to cache a  
                               program with the remote media server;

25                         the remote media server is further  
                               configured to cache the program in response to the  
                               record request provided by the Internet service system  
                               when the user indicated a desire to cache a program;  
                               and

30                         the personal computer is further  
                               configured to indicate to the user a charge for a  
                               program that the user has indicated a desire to cache  
                               with the remote media server, wherein the charge is  
                               based on the length of the program.

35                         318. The system defined in claim 250 wherein  
                               the personal computer is further configured to provide  
                               a user with an opportunity to enter a parental control  
                               code when the user indicates a desire to record a  
                               program with the remote media server.

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319. The system defined in claim 250 wherein:  
the personal computer is further configured to provide  
a user with an opportunity to enter a parental control  
code when the user indicates a desire to play back a  
program with the remote media server.

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320. The system defined in claim 250 wherein:  
the personal computer is further  
configured to provide a user with an opportunity to set  
an audio format in which programs are recorded with the  
remote media server; and  
the remote media server is further  
configured to record programs in the audio format.

20

321. The system defined in claim 250 wherein:  
the personal computer is further  
configured to provide a user with an opportunity to set  
a video format in which programs are recorded with the  
remote media server; and  
the remote media server is further  
configured to record programs in the video format.

25

322. The system defined in claim 250 wherein:  
the personal computer is further  
configured to provide a user with an opportunity to set  
a language in which program audio on a digital audio  
track is recorded with the remote media server; and  
the remote media server is further  
configured to record program audio in the language.

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323. The system defined in claim 250 wherein:

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10                   the remote media server is further  
configured to automatically cache current programs that  
are being viewed by users; and

15                   the Internet service system is further  
configured to provide a playback request to the remote  
media server for a cached program when a user indicates  
a desire to view at least a portion of the cached  
program; and

20                   the remote media server is further  
configured to play back at least a portion of a cached  
program in response to a playback request for the  
cached program provided by the Internet service system.

25                   324. The system defined in claim 250 wherein  
                      the remote media server is further  
configured to automatically cache current programs that  
are being viewed by a subset of the users;

30                   the Internet service system is further  
configured to provide a playback request to the remote  
media server for a cached program when a user of the  
subset of users indicates a desire to view at least a  
portion of the cached program; and

35                   the remote media server is further  
configured to play back at least a portion of a cached  
program in response to a playback request for the  
cached program provided by the Internet service system.

40                   325. An interactive television program guide  
system in which television programs are recorded and  
retrieved on-demand for a number of users, the system  
comprising:

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10                   a remote media server configured to  
store and retrieve programs on-demand for each user;  
                  a personal computer; and  
                  an Internet service system configured  
to:

15                   provide a record request to the  
remote media server when a user indicates a desire to  
record a program on-demand with the remote media  
server; and

20                   provide a retrieval request to the  
remote media server when a user indicates a desire to  
play back a program on-demand with the remote media  
server, and wherein the remote media server is further  
configured to:

25                   record a program in response to the  
record request provided by the Internet service system;  
and

30                   retrieve a program in response to  
the retrieval request provided by the Internet service  
system.

35                   326. The system defined in claim 325 wherein  
the Internet service system is configured to distribute  
programs to each user as at least one file.

40                   327. The system defined in claim 325 wherein  
the Internet service system is configured to distribute  
programs to each user in digital data streams.

45                   328. The system defined in claim 325 wherein:

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the personal computer is further configured to play back a program that was retrieved by the remote media server.

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329. The system defined in claim 325 wherein:  
the remote media server is further configured to store and retrieve on-demand program guide data associated with the programs stored by the remote media server; and

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the personal computer is further configured to present program guide data to the users as if an associated program were being originally aired.

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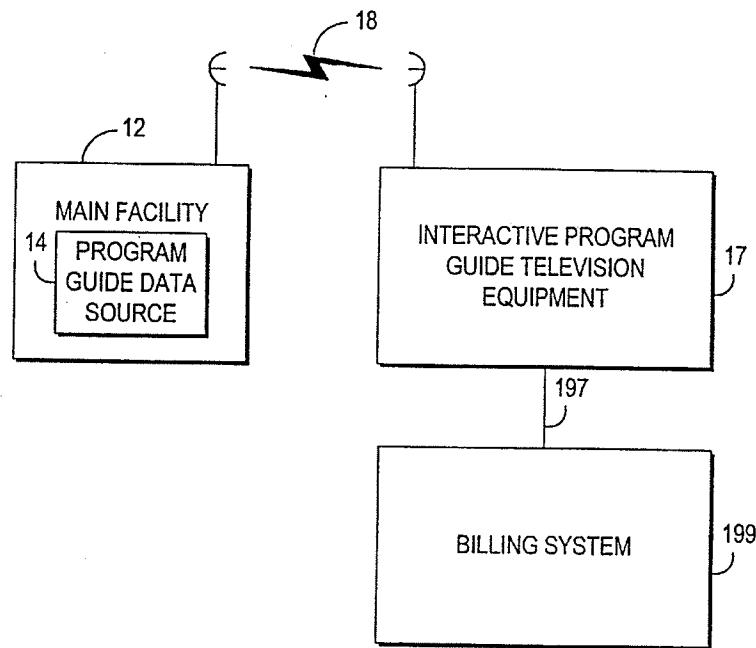
10

FIG. 1

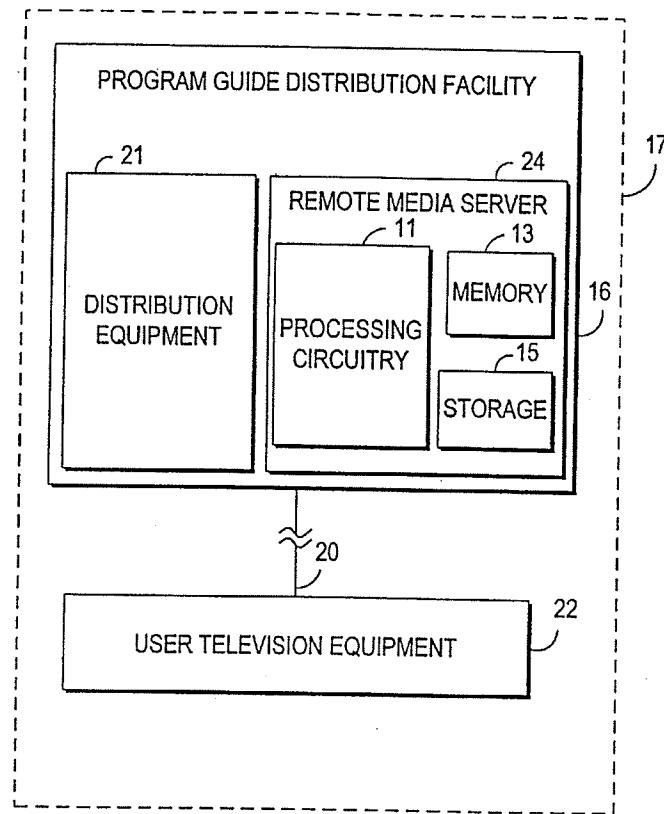


FIG. 2a

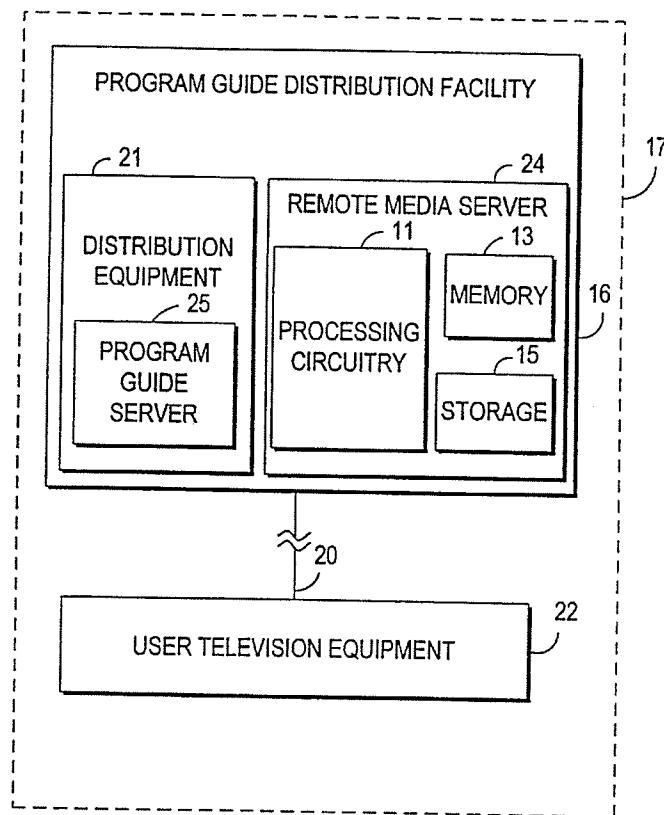


FIG. 2b

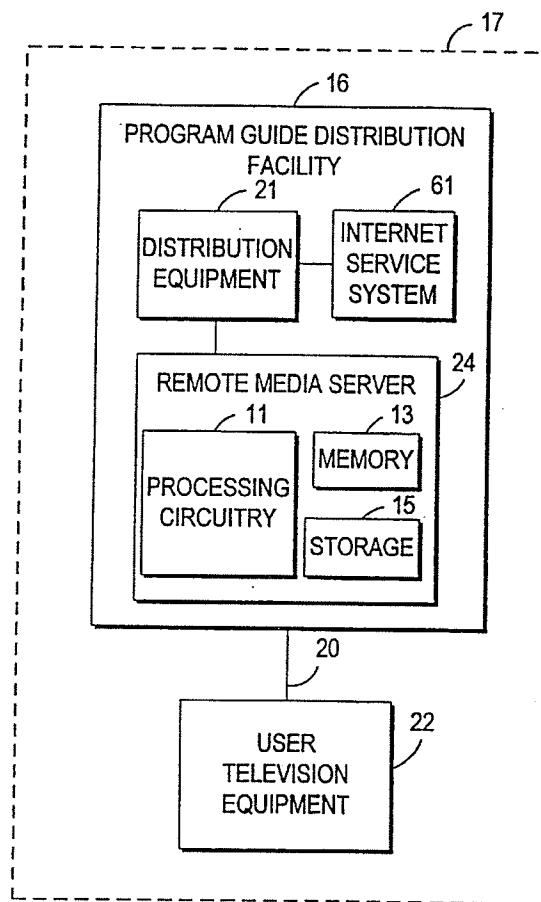


FIG. 2c

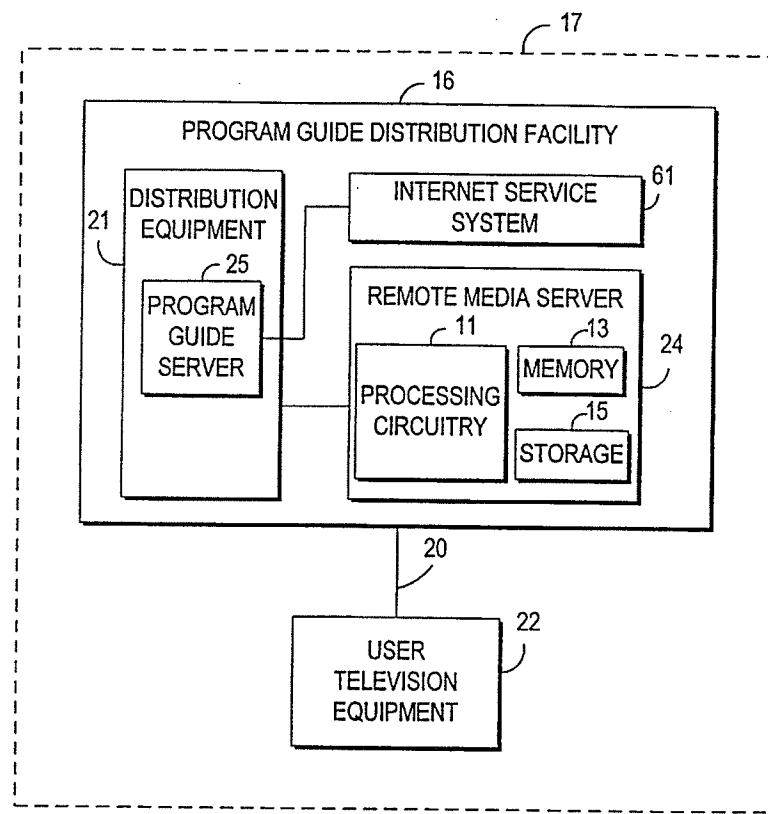


FIG. 2d

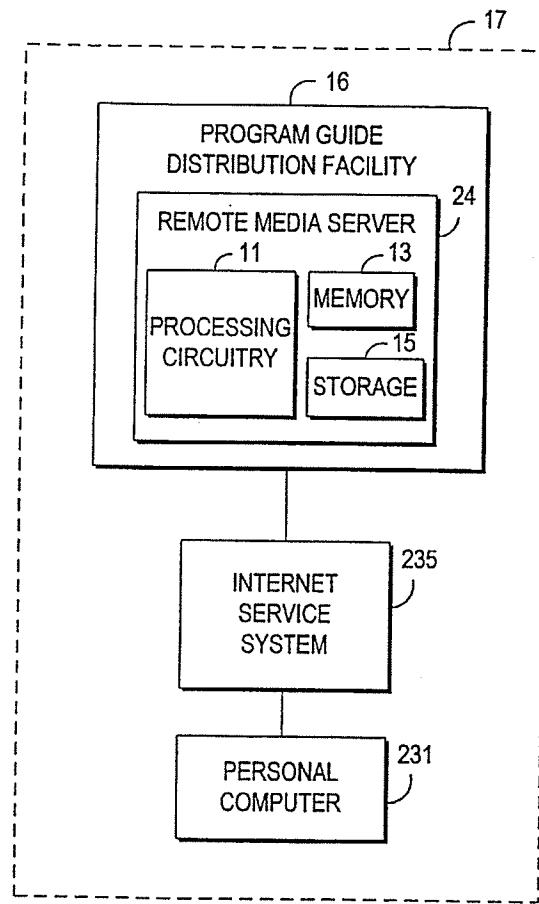


FIG. 2e

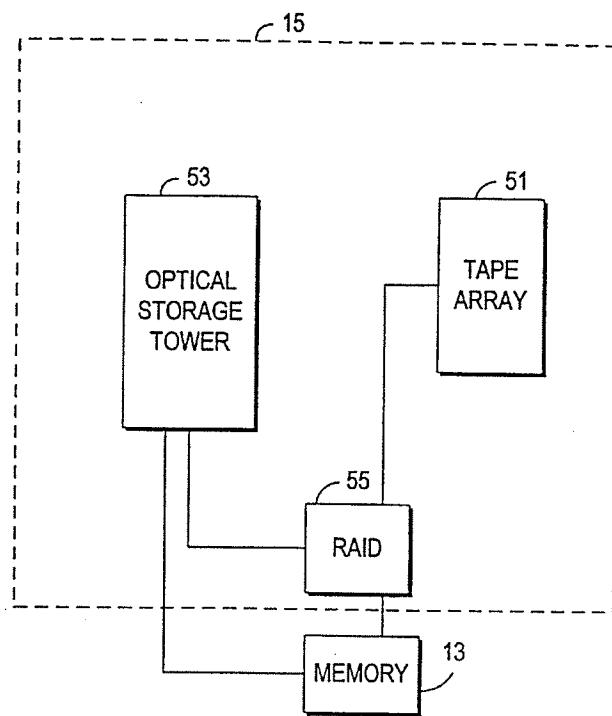


FIG. 3

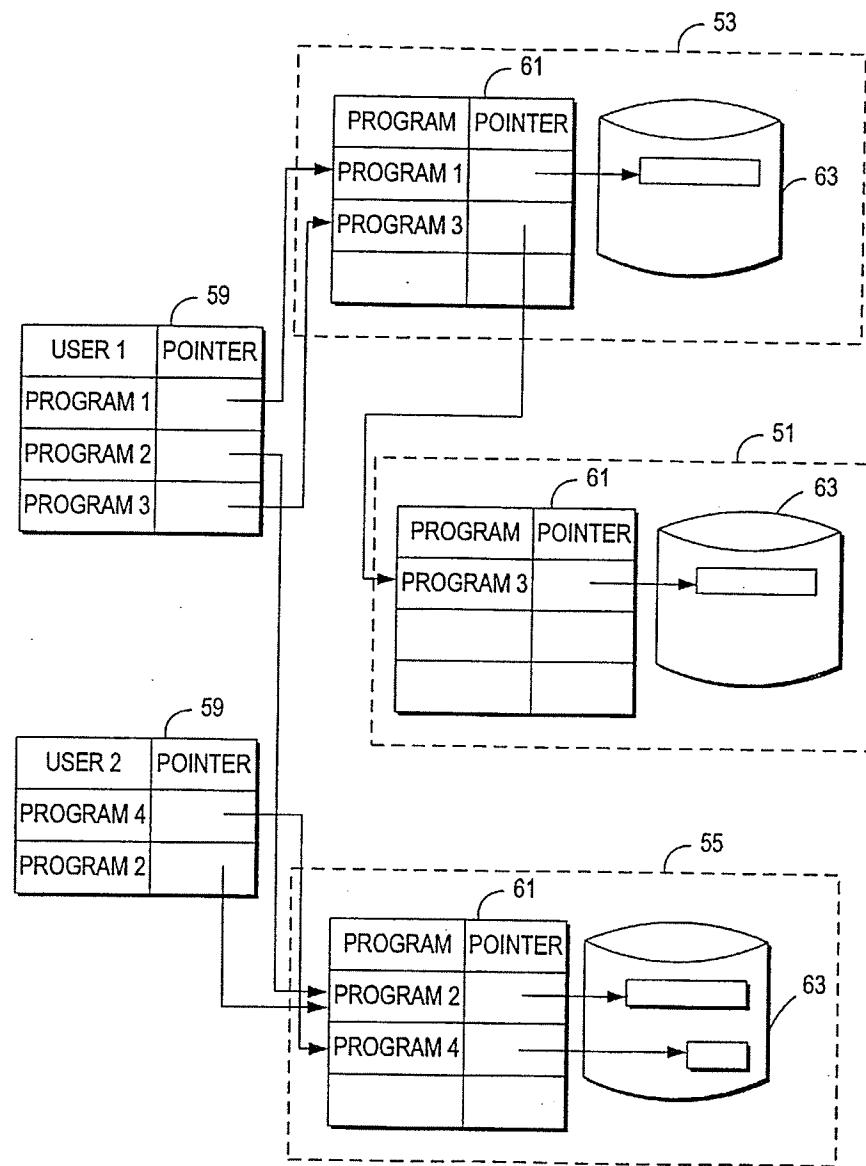


FIG. 4

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FIG. 5

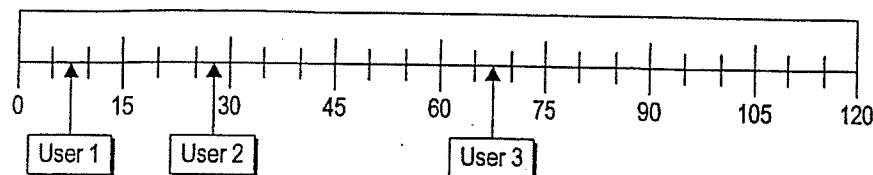


FIG. 6a

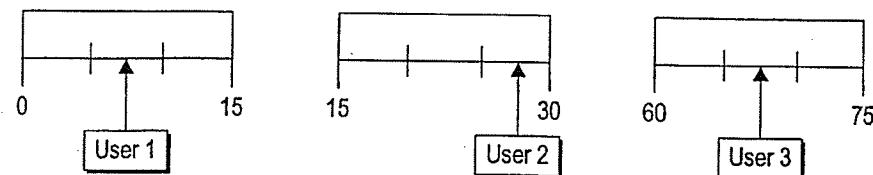


FIG. 6b

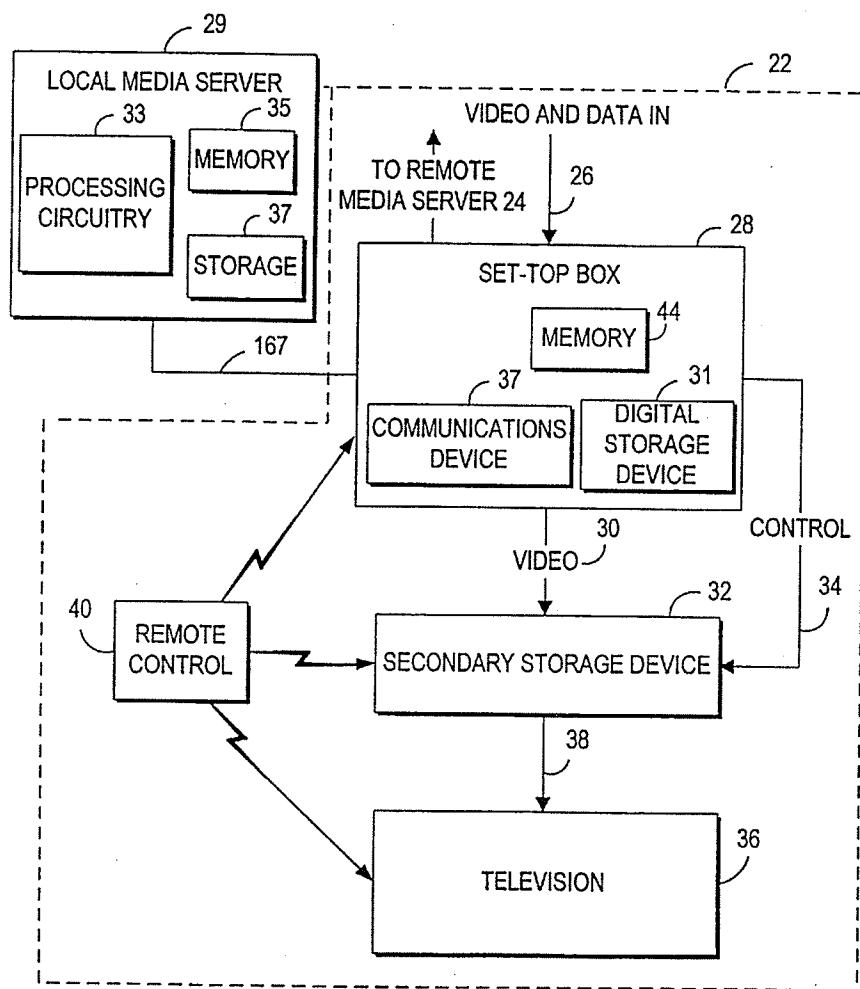


FIG. 7

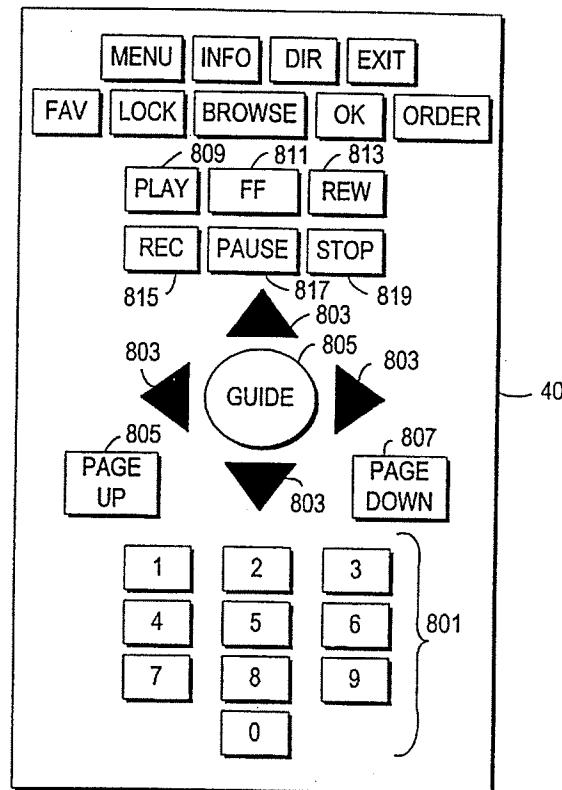


FIG. 8

SUBSTITUTE SHEET (RULE 26)

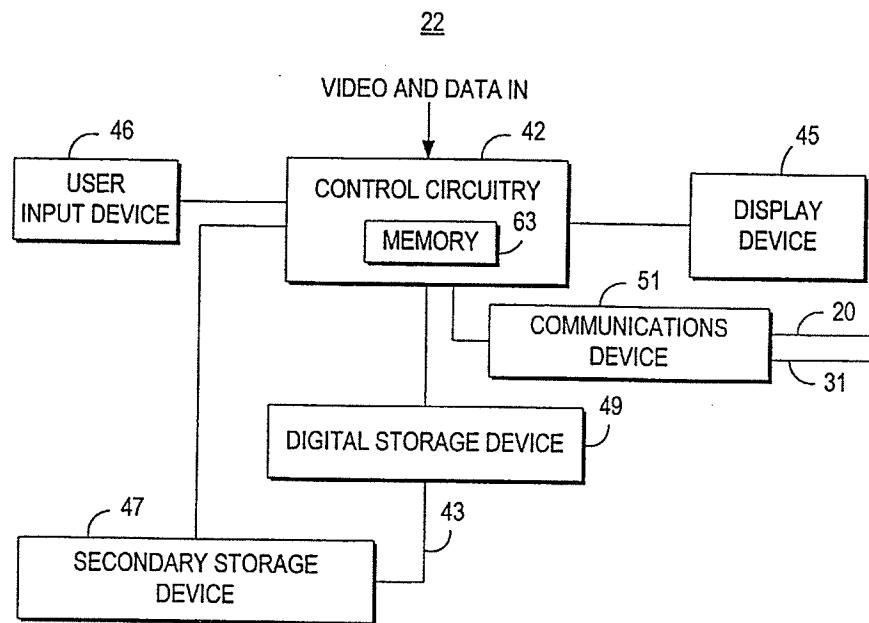


FIG. 9

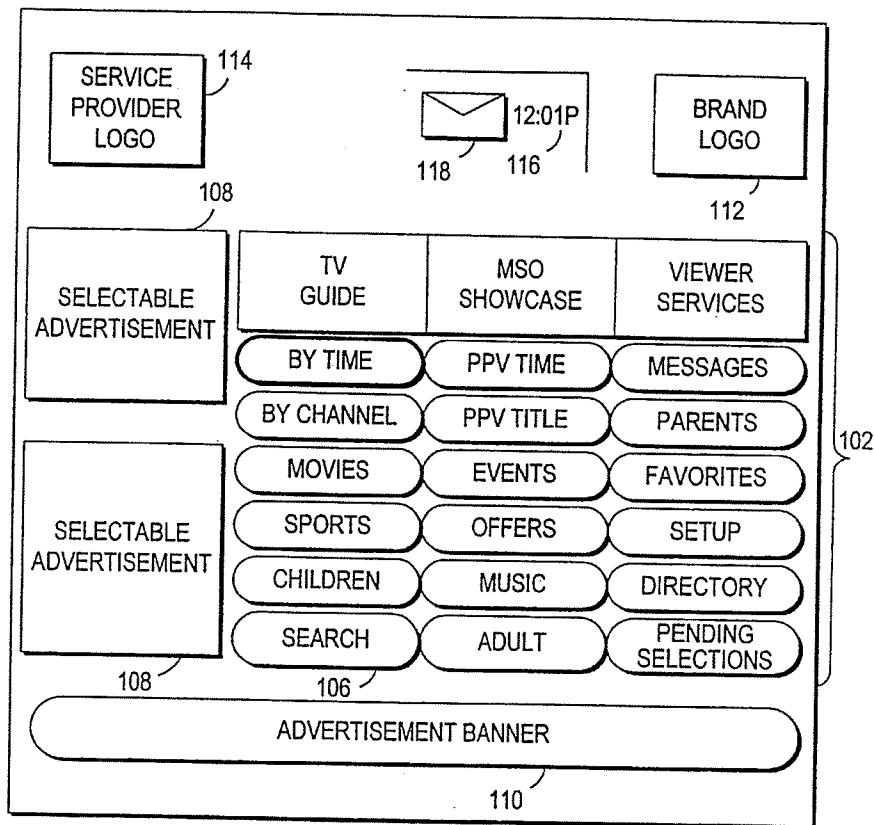
100

FIG. 10

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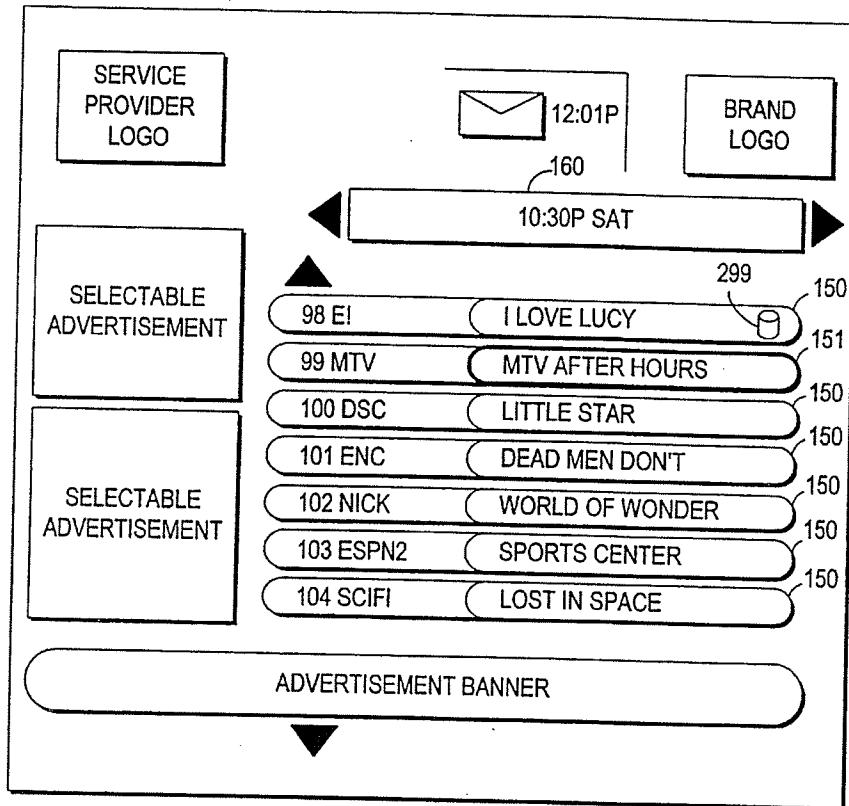
130

FIG. 11a

SUBSTITUTE SHEET (RULE 26)

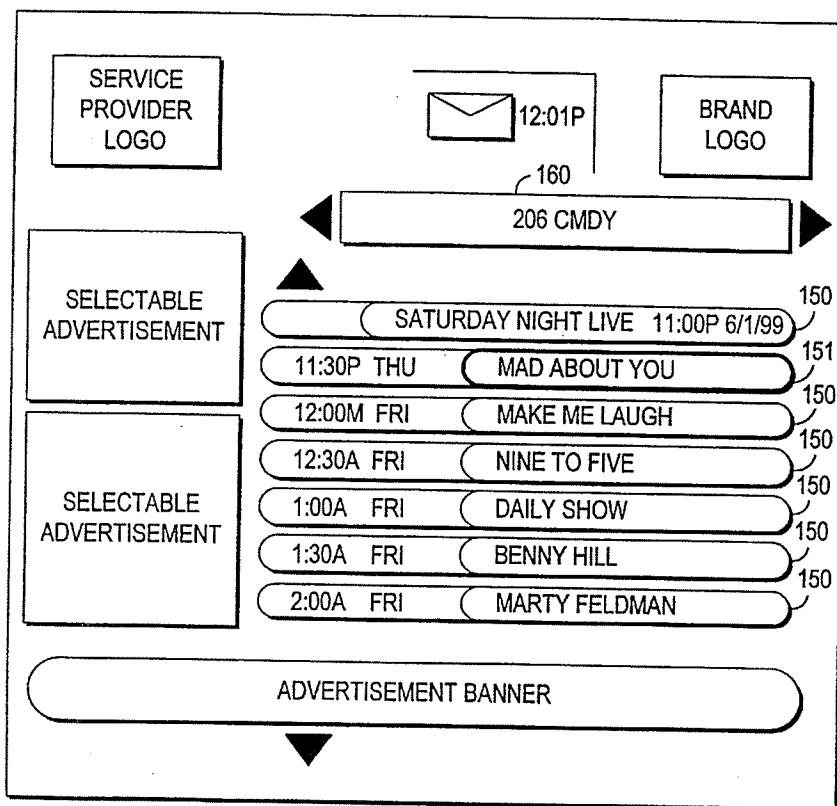
135

FIG. 11b

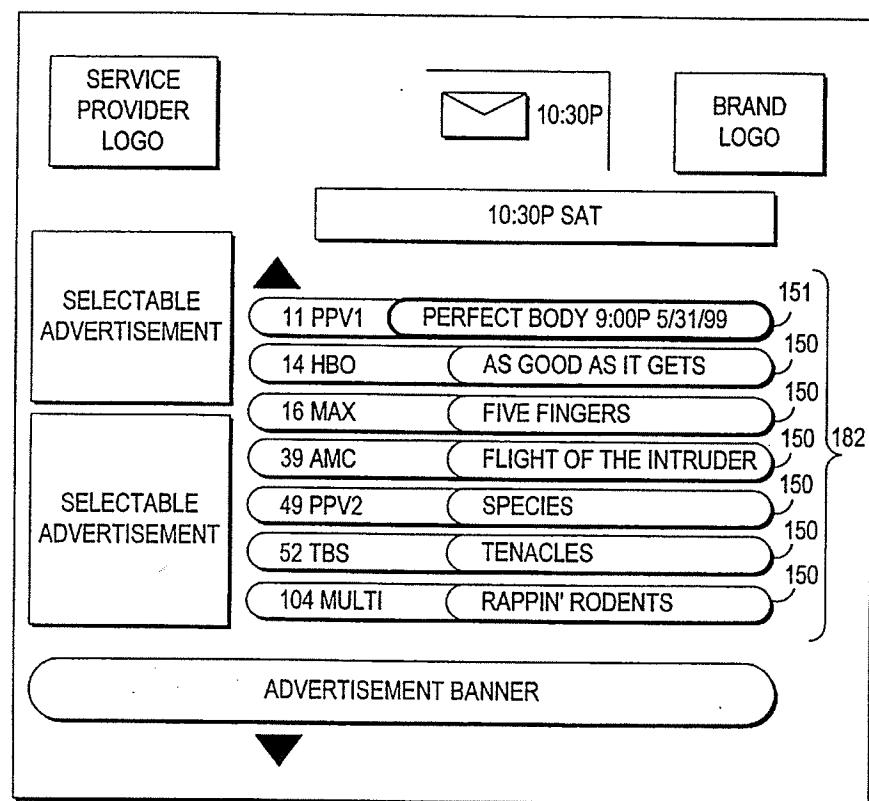
140

FIG. 11c

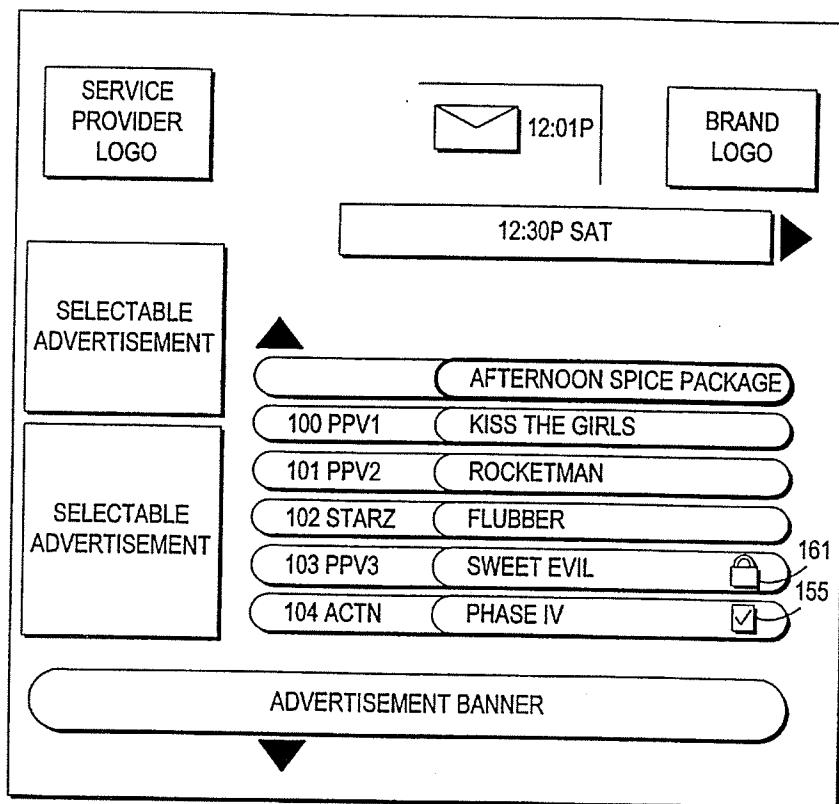
203

FIG. 12a

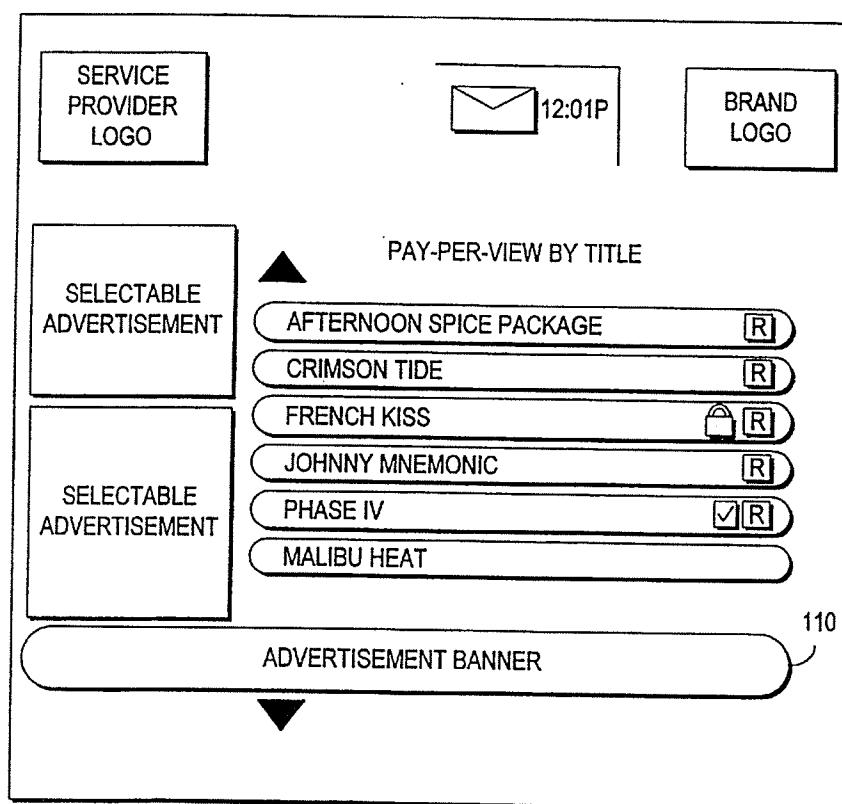
211

FIG. 12b

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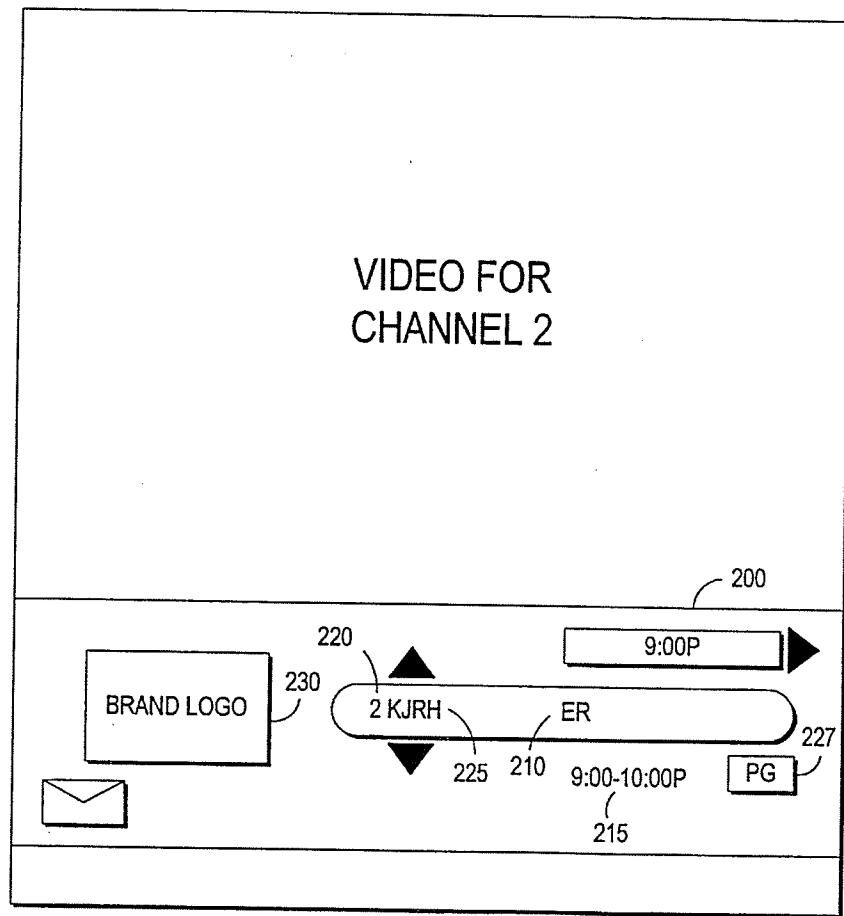


FIG. 13a

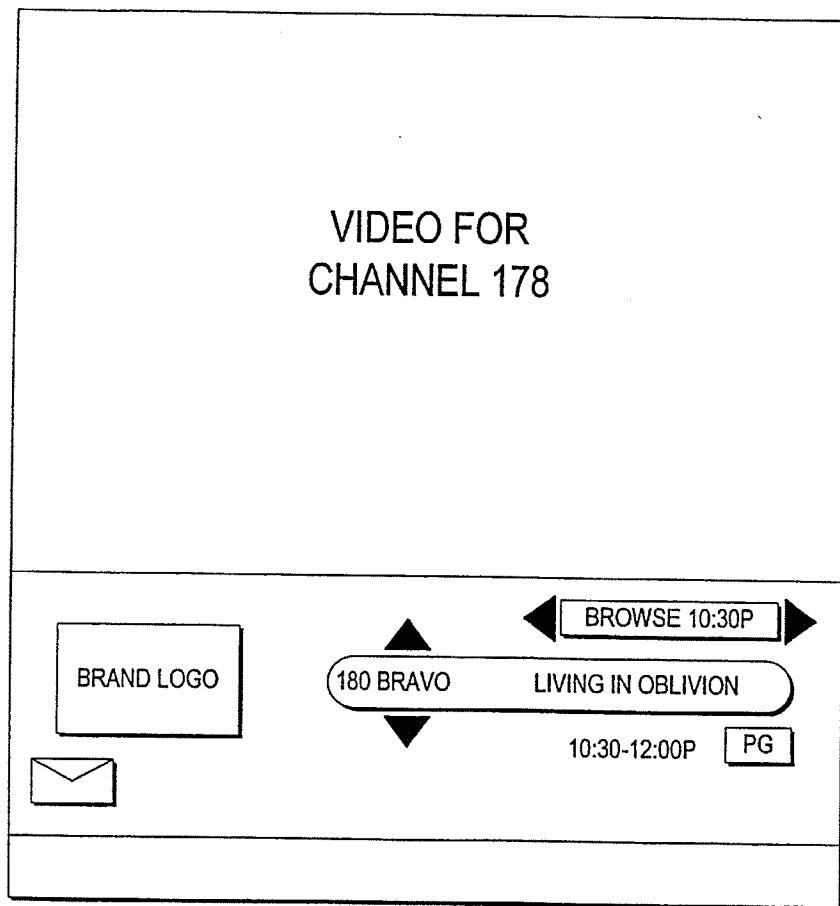


FIG. 13b

SUBSTITUTE SHEET (RULE 26)

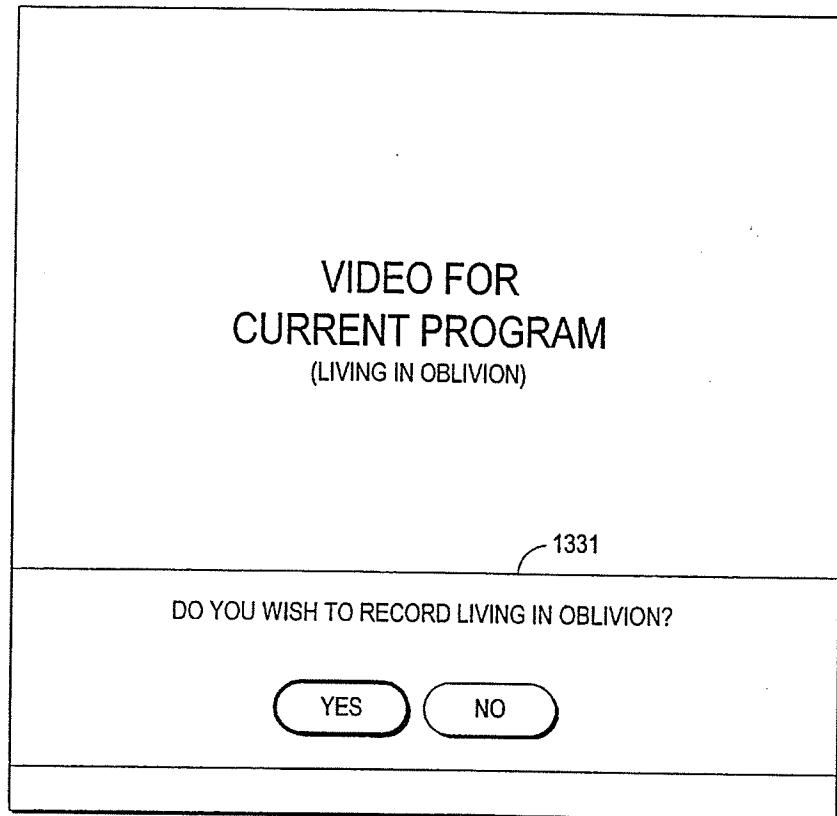


FIG. 14a

SUBSTITUTE SHEET (RULE 26)

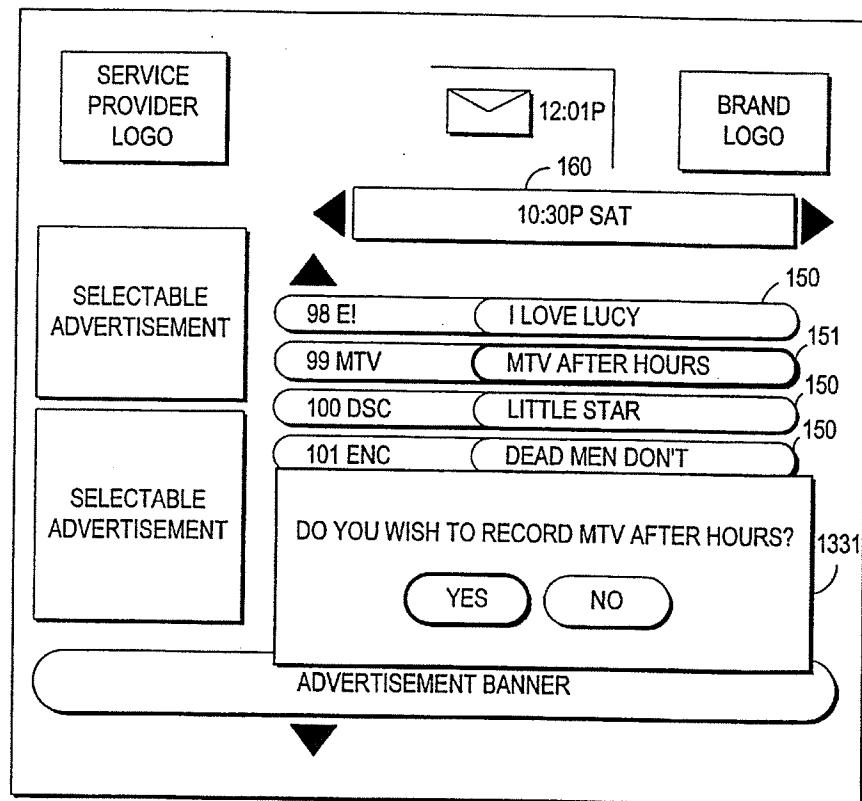


FIG. 14b

SUBSTITUTE SHEET (RULE 26)

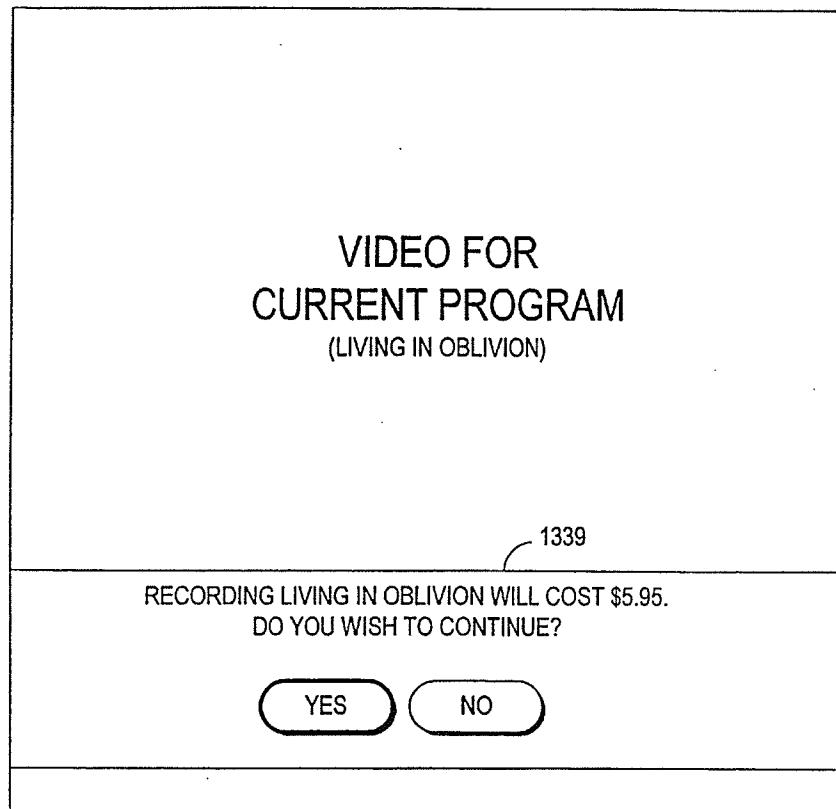


FIG. 14c

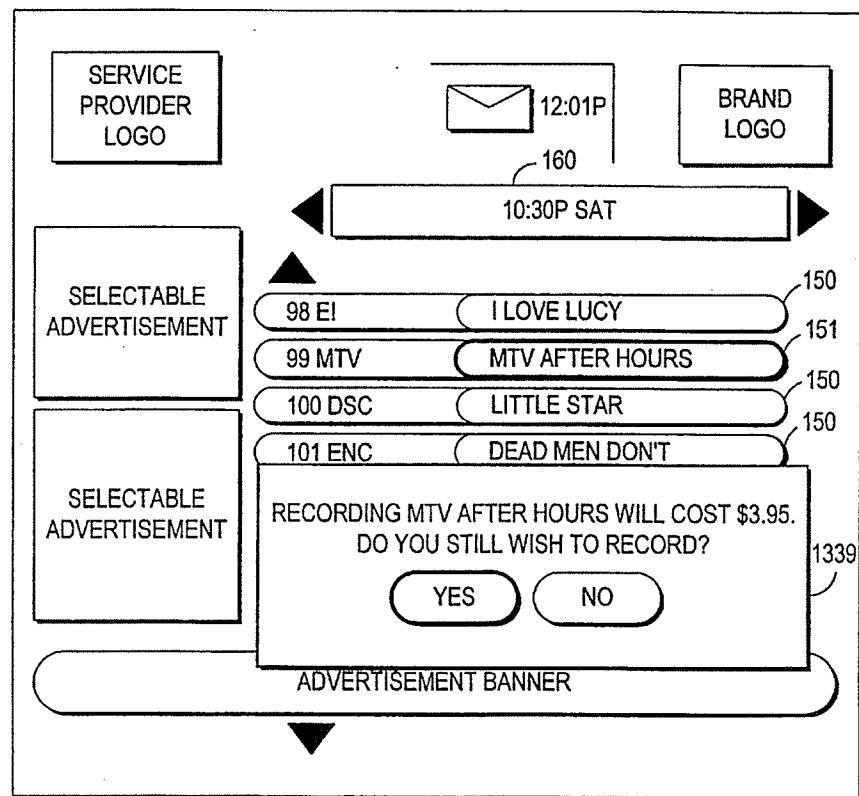


FIG. 14d

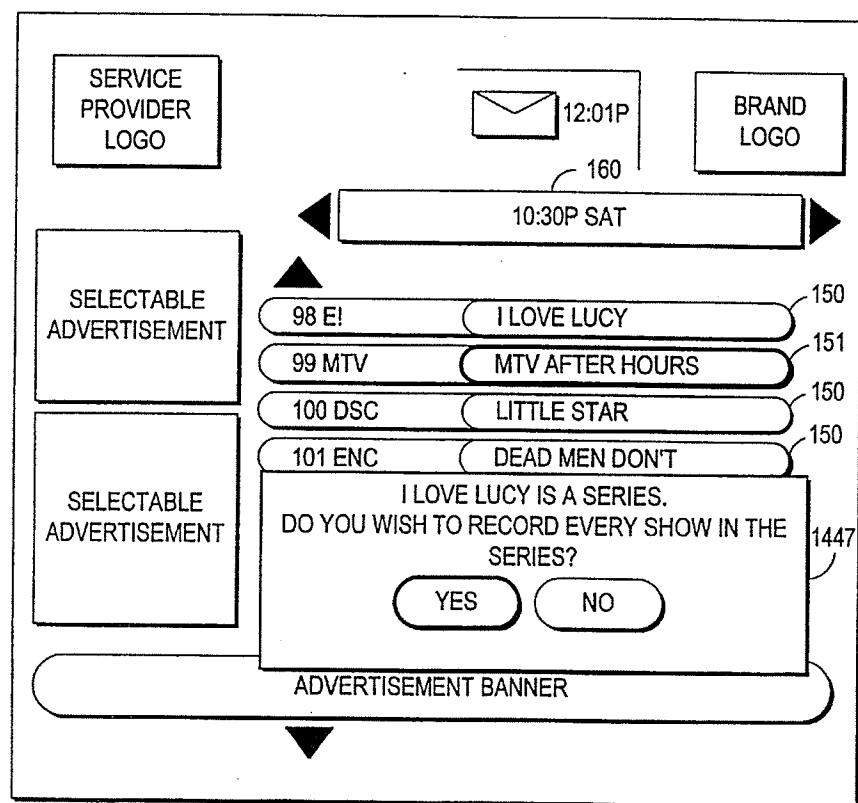


FIG. 14e

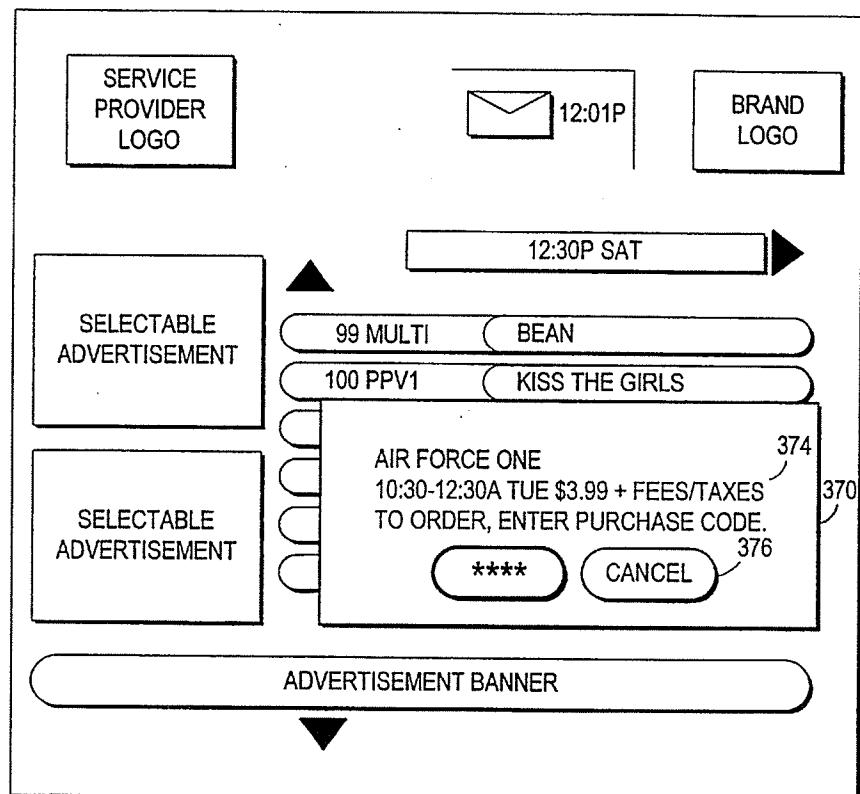


FIG. 15a

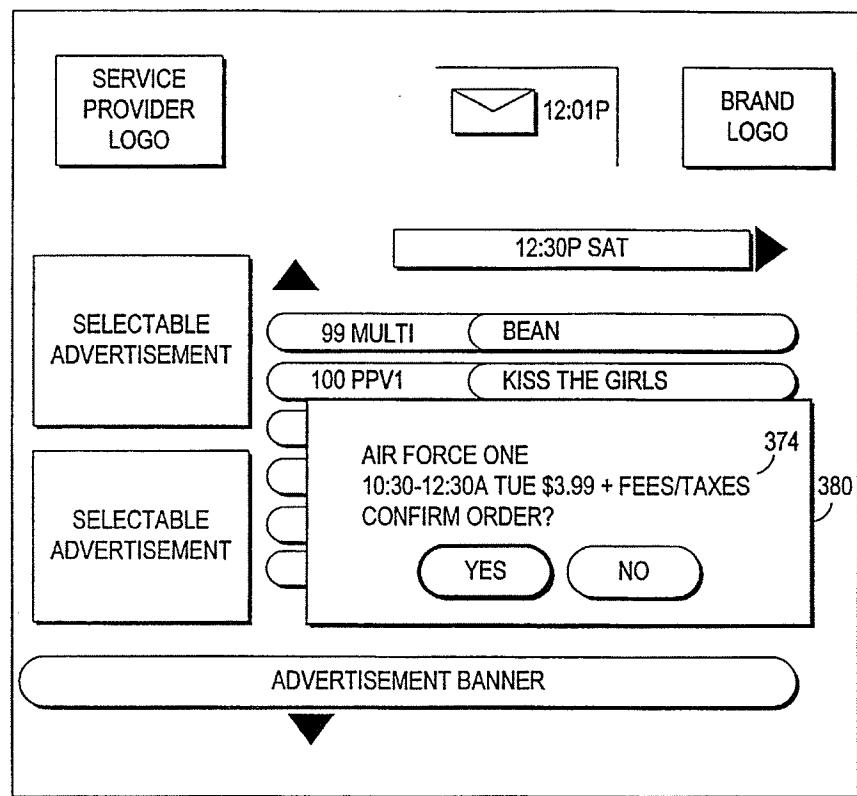


FIG. 15b

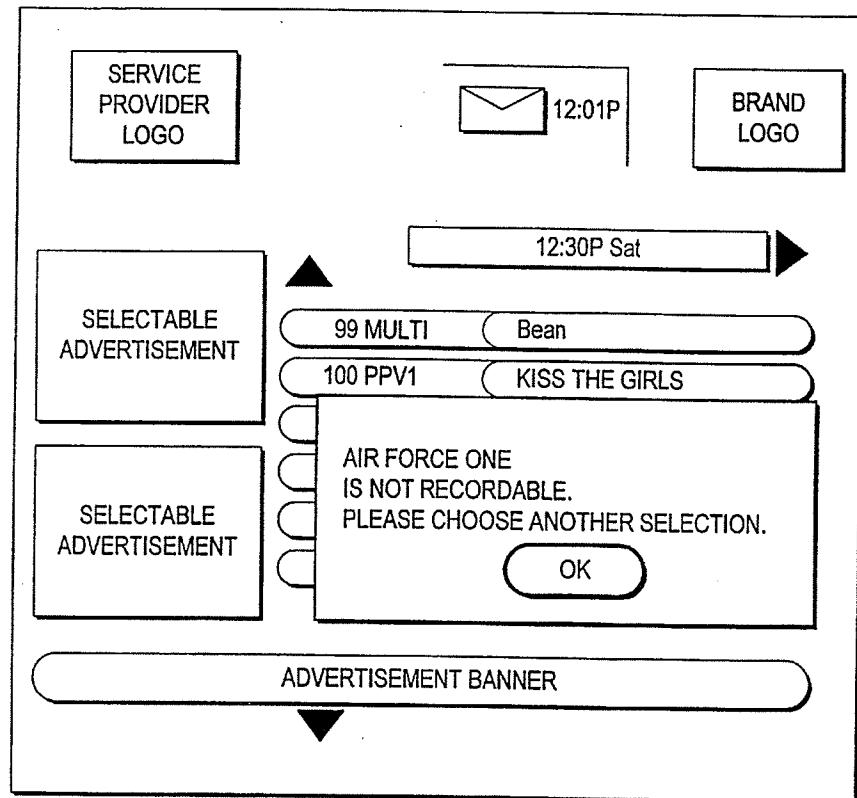


FIG. 16

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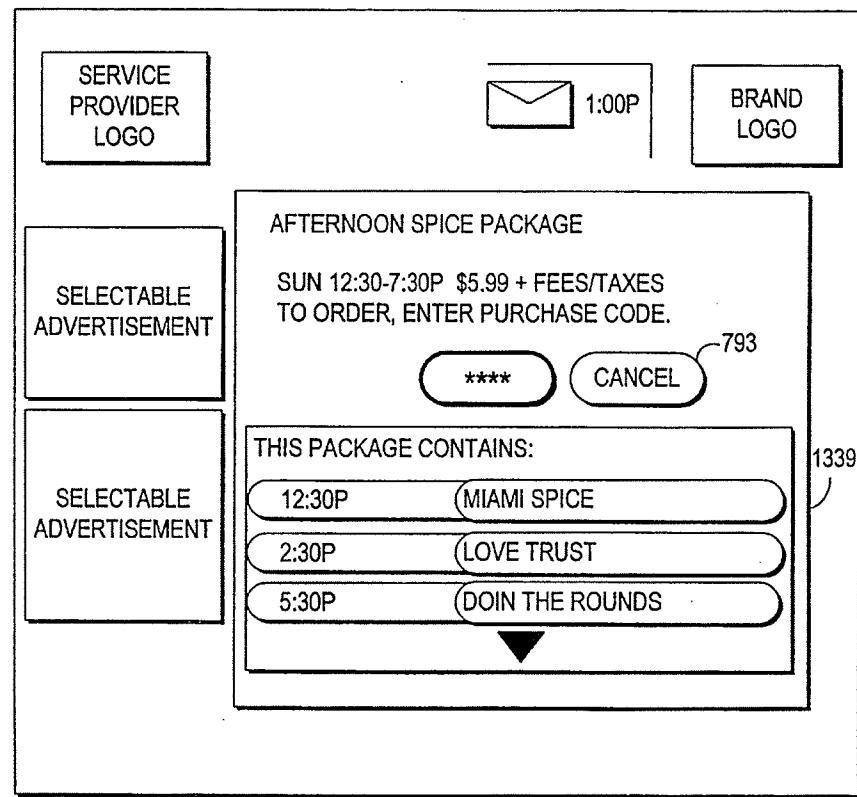
811

FIG. 17

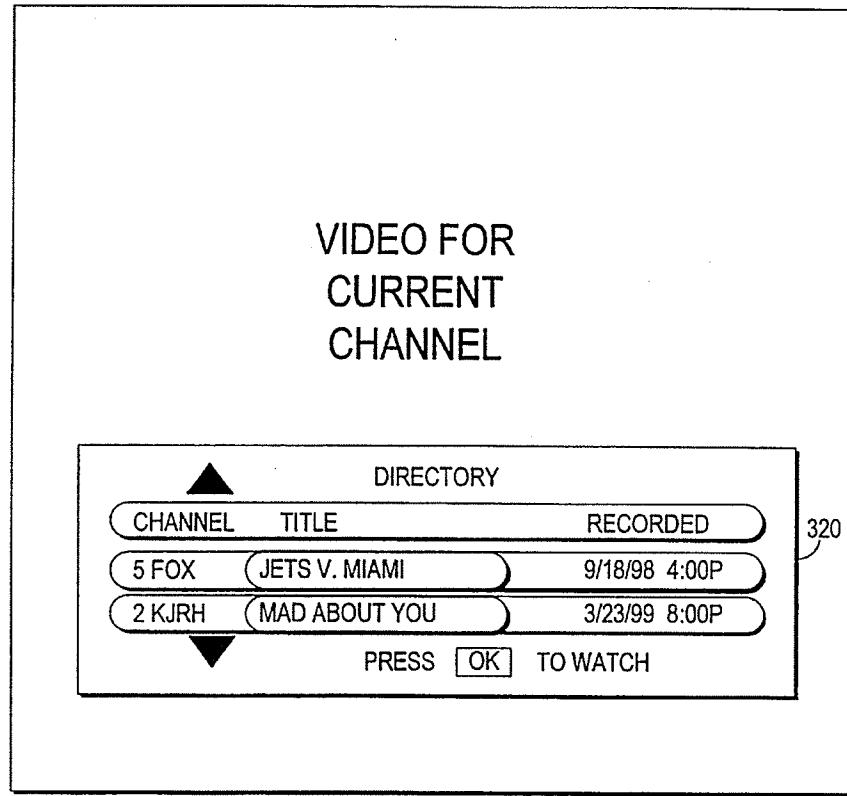


FIG. 18a

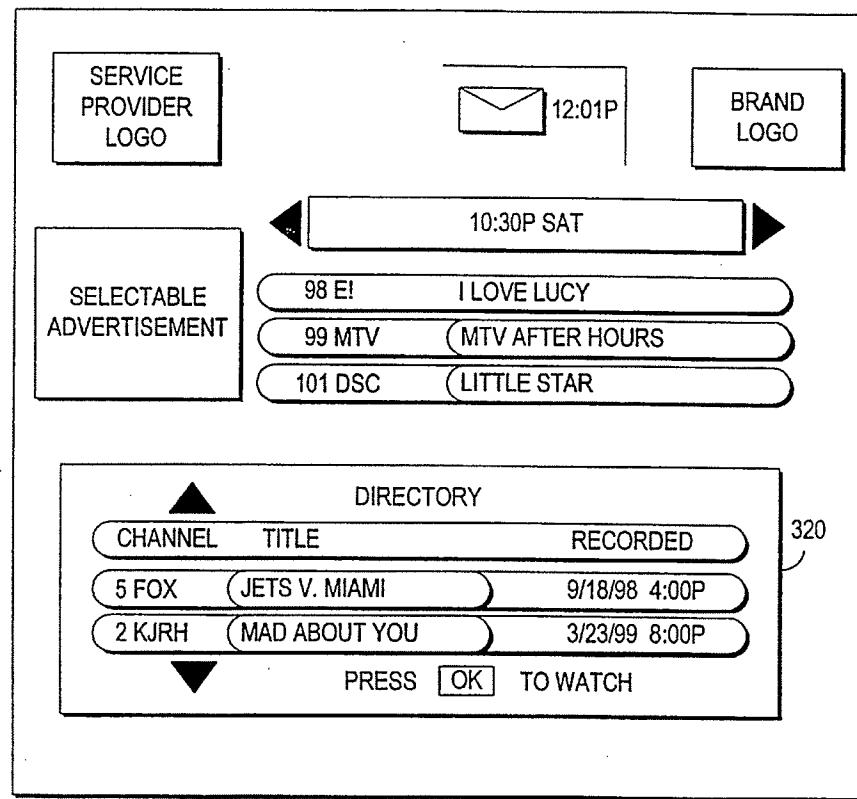


FIG. 18b

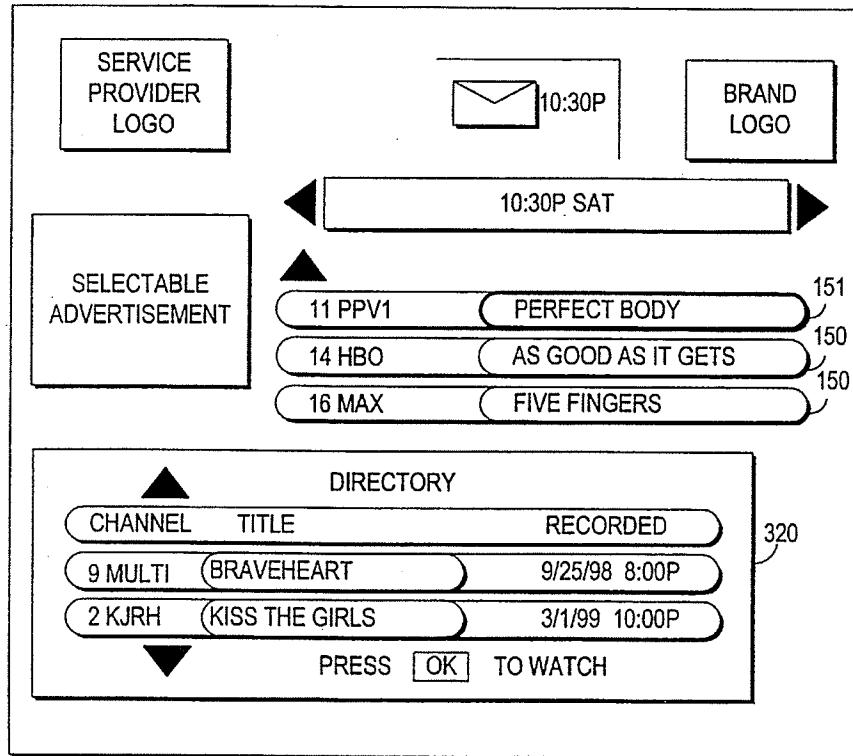


FIG. 18c

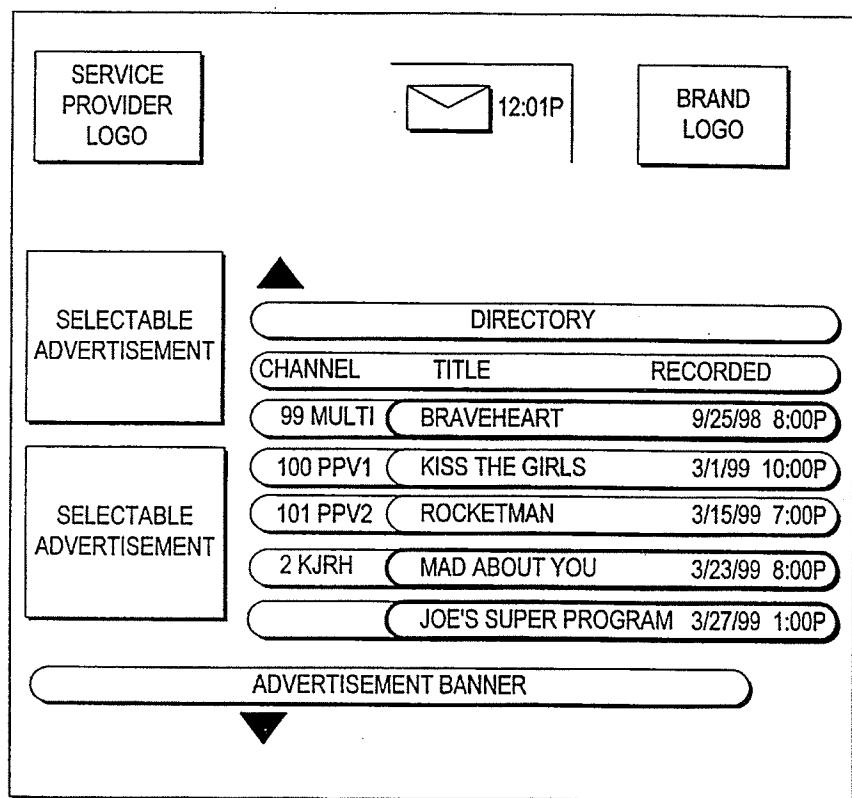
350

FIG. 18d

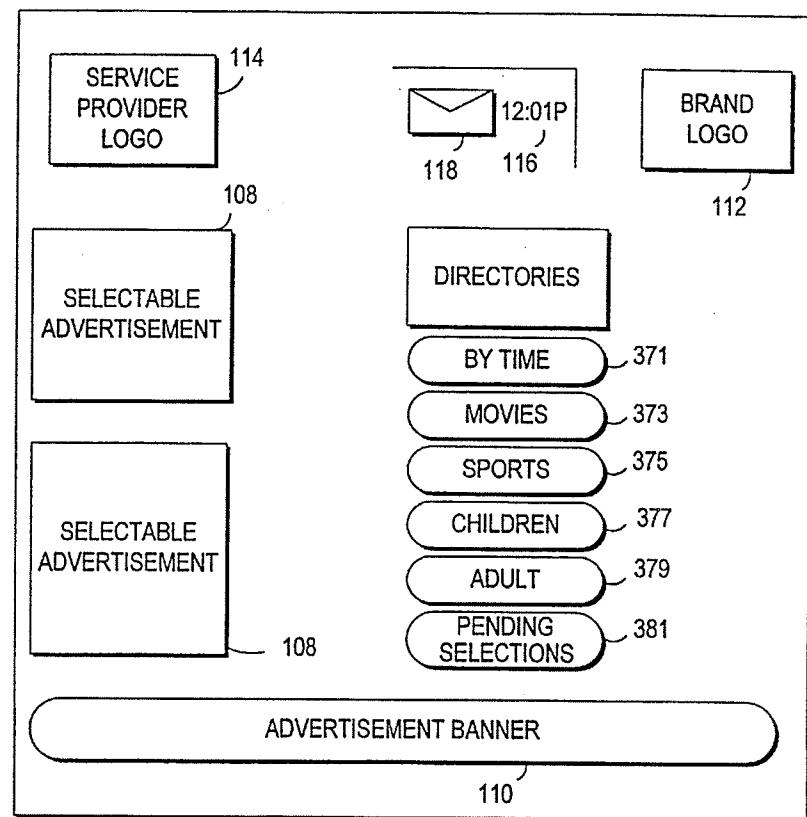
370

FIG. 18e

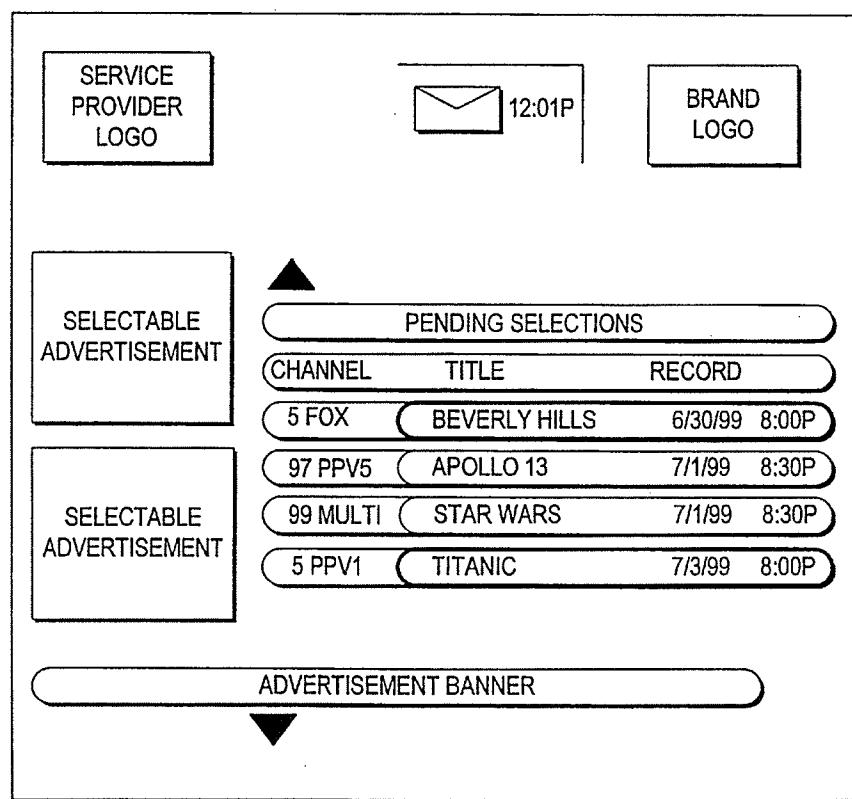
390

FIG. 18f

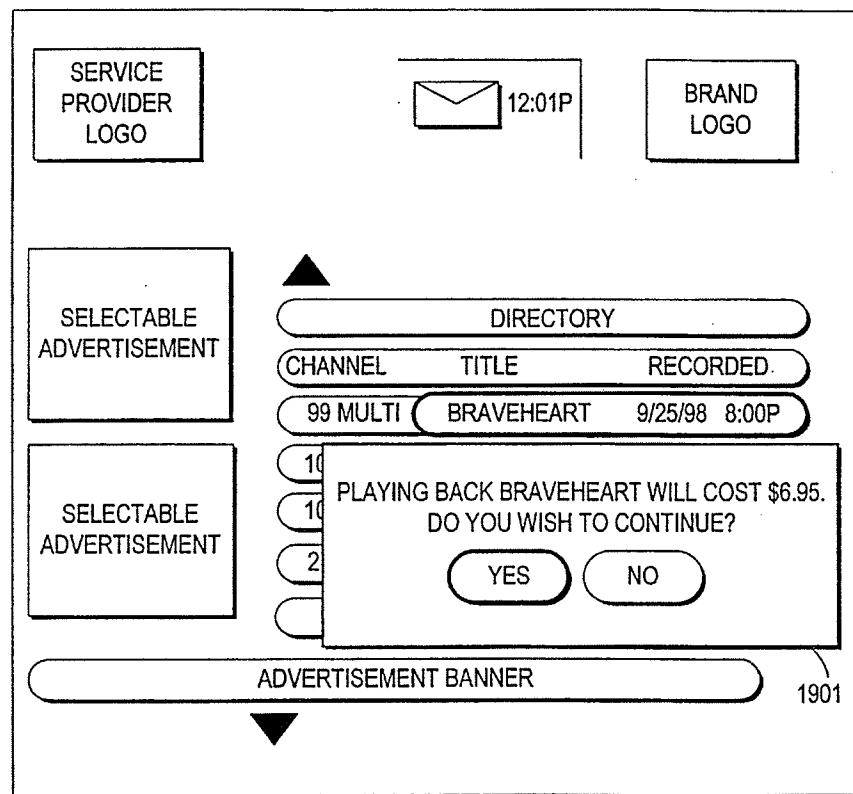


FIG. 19

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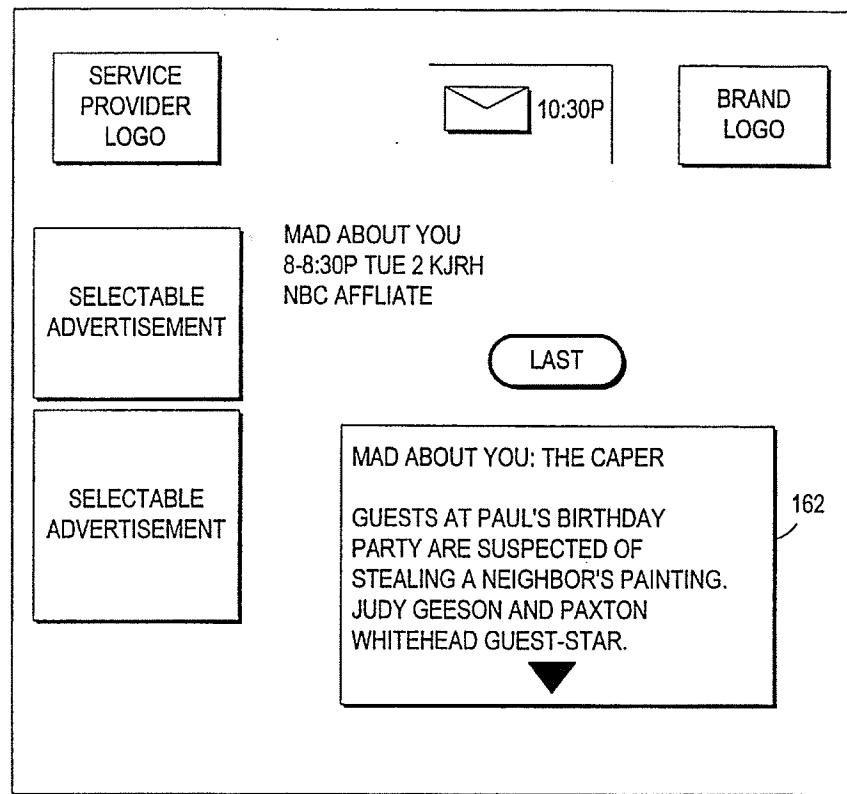
161

FIG. 20

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PCT/US99/15939

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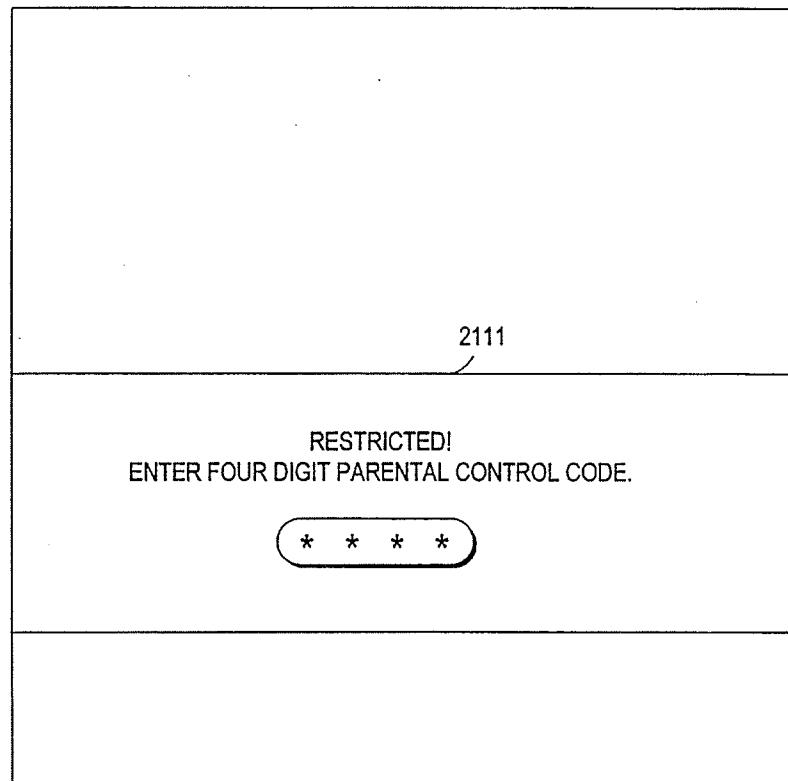


FIG. 21

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PCT/US99/15939

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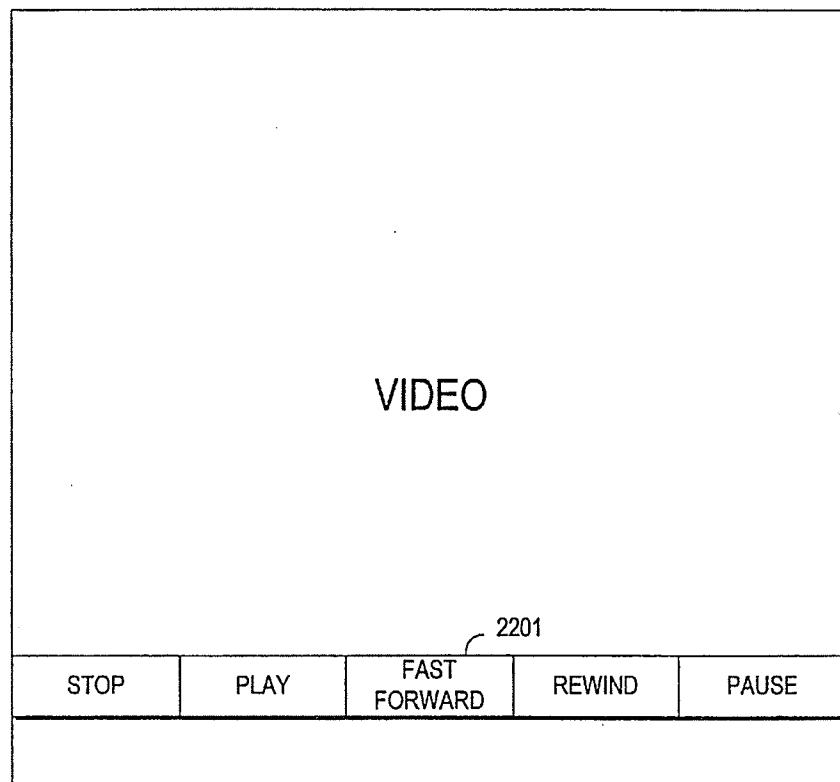


FIG. 22

SUBSTITUTE SHEET (RULE 26)

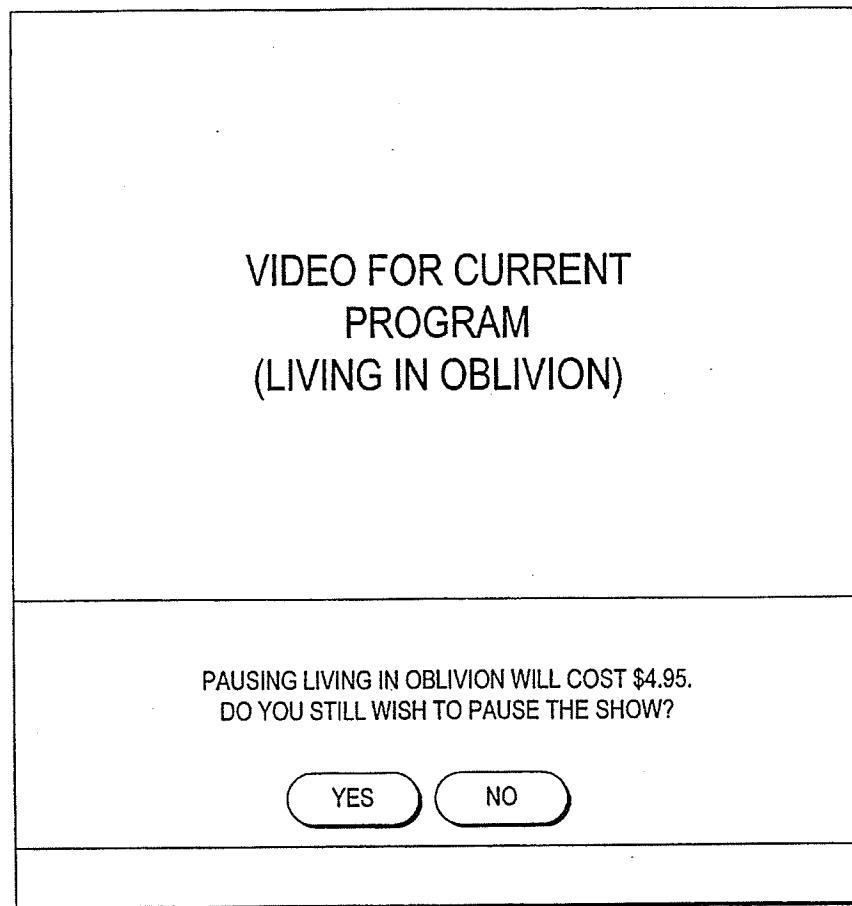


FIG. 23

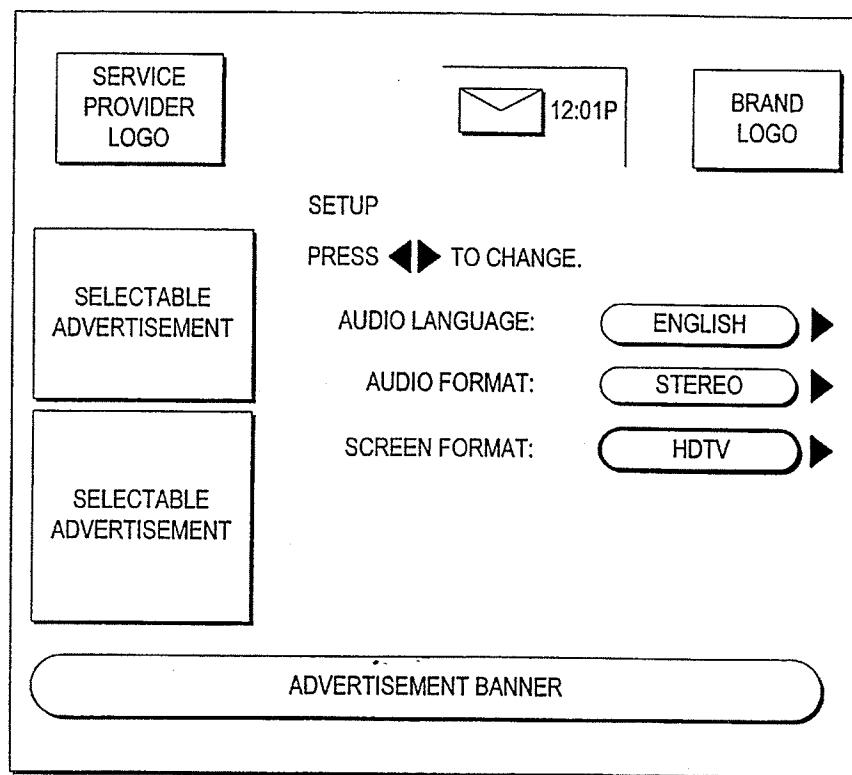
2401

FIG. 24

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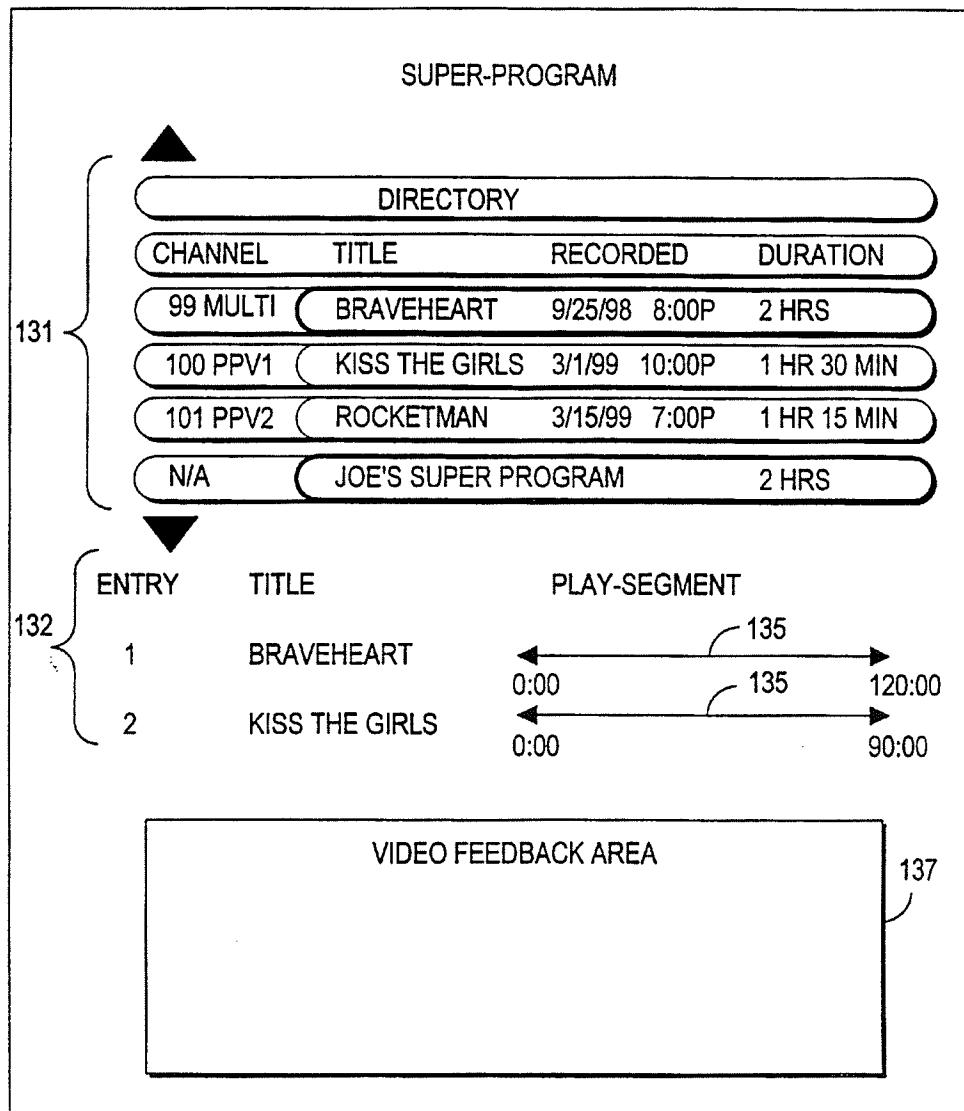
130

FIG. 25a

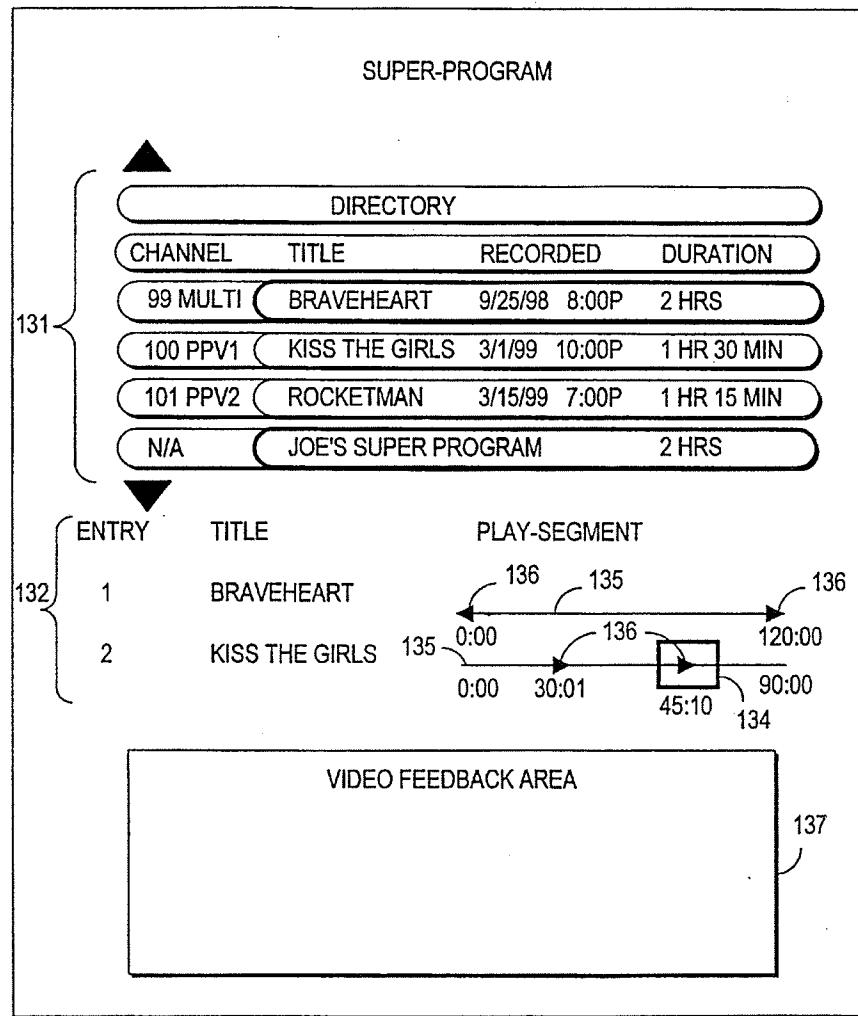
130

FIG. 25b

SUBSTITUTE SHEET (RULE 26)

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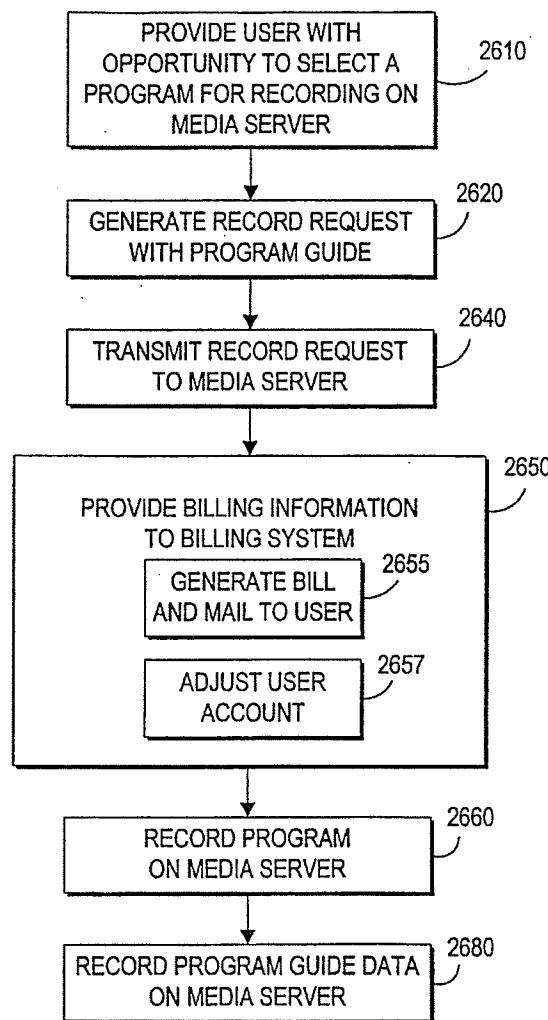


FIG. 26

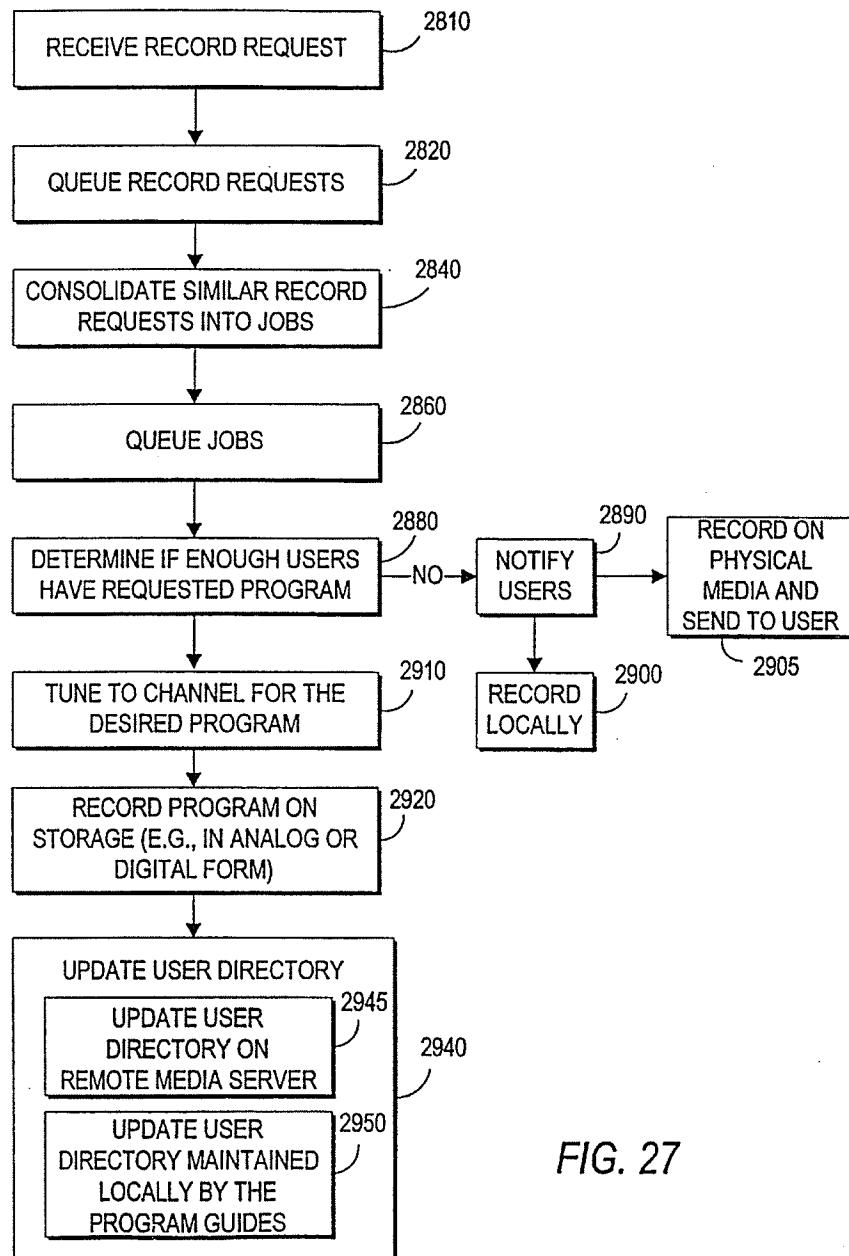


FIG. 27

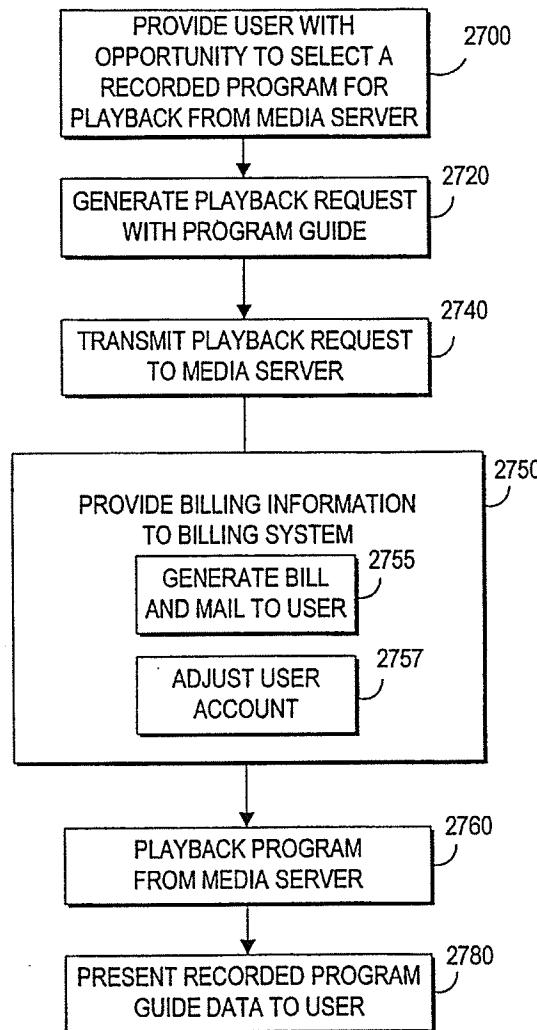


FIG. 28

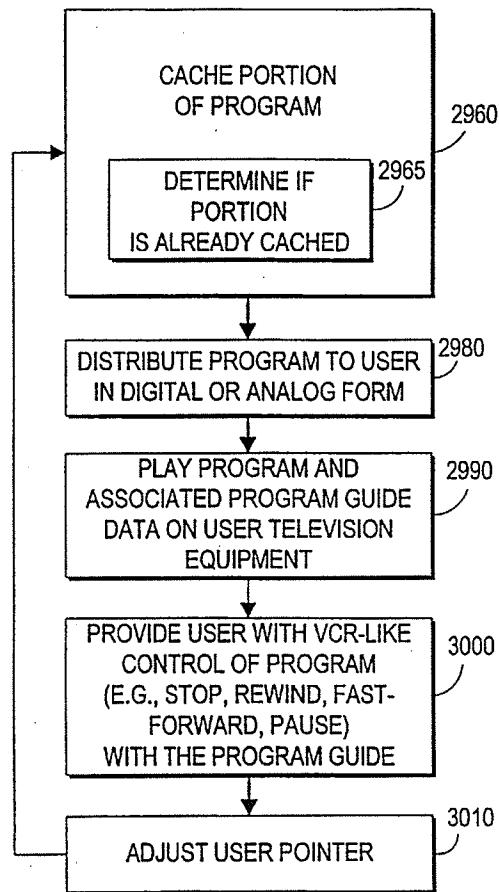


FIG. 29

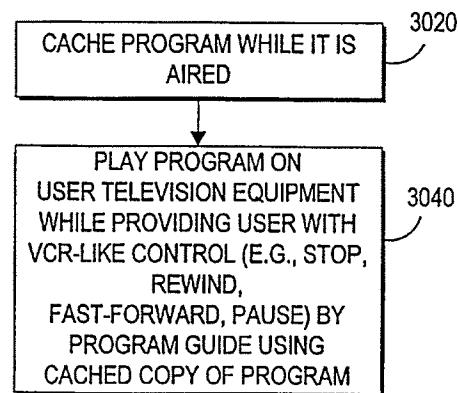


FIG. 30

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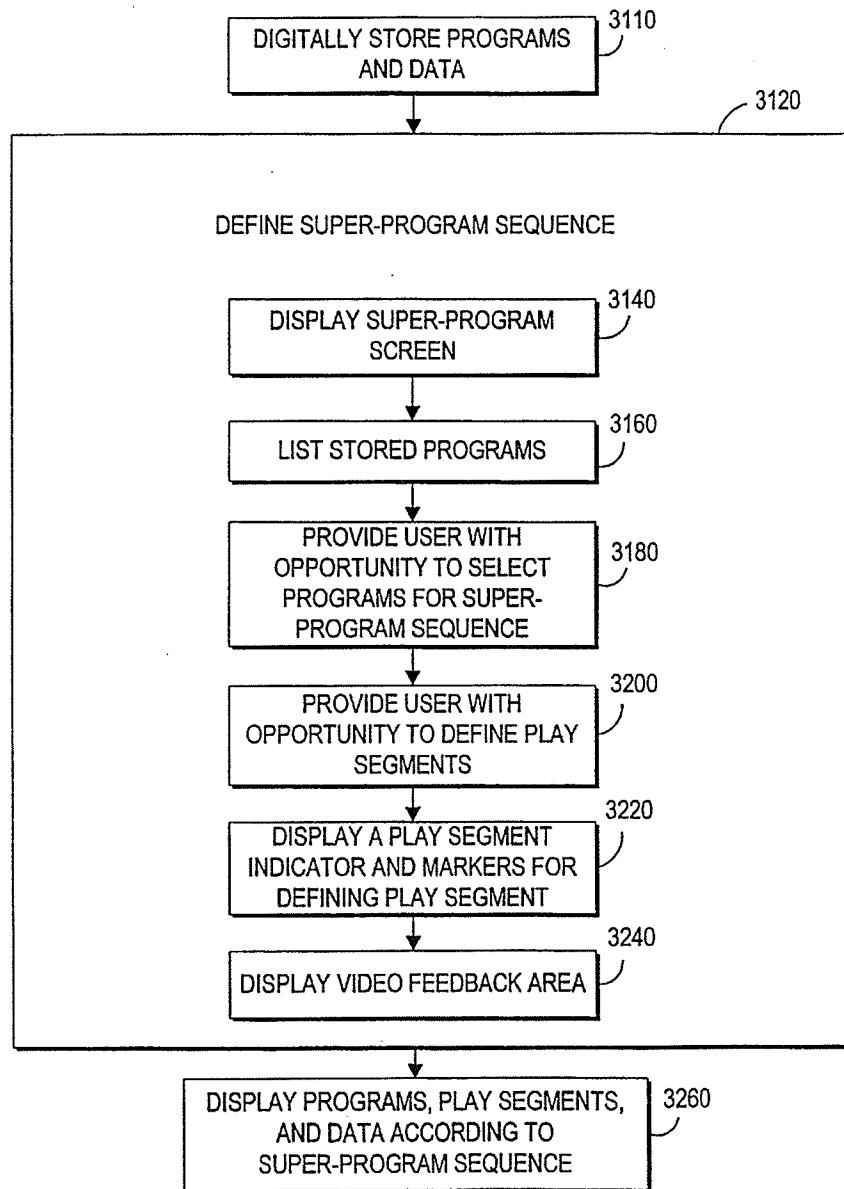


FIG. 31

SUBSTITUTE SHEET (RULE 26)